



Federal Highway Administration

23 CFR Part 650

[FHWA Docket No. FHWA–2017-0047]

RIN 2125-AF55

National Bridge Inspection Standards

AGENCY: Federal Highway Administration (FHWA), U.S. Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: This final rule updates the National Bridge Inspection Standards (NBIS) for highway bridges. The Moving Ahead for Progress in the 21st Century Act (MAP-21) required the Secretary of Transportation (Secretary) to update the NBIS. Through this final rule, FHWA updates the NBIS to address MAP-21 requirements, incorporate technological advancements including the use of unmanned aircraft systems, and addresses ambiguities identified since the last update to the regulation in 2009. FHWA also is repealing two outdated regulations: the Highway Bridge Replacement and Rehabilitation Program and the Discretionary Bridge Candidate Rating Factor.

DATES: This final rule is effective [INSERT DATE 30 DAYS ATER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

FOR FURTHER INFORMATION CONTACT: Mr. Thomas Drda, P.E., Office of Bridges and Structures, HIBS–30, (919) 747-7011, or Mr. William Winne, Office of the Chief Counsel, HCC–30, (202) 366–1397, Federal Highway Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590.

SUPPLEMENTARY INFORMATION:

Electronic Access and Filing

This document, the Notice of Proposed Rulemaking (NPRM), all comments received, and all background material may be viewed online at <http://www.regulations.gov> using the docket number listed above. Electronic retrieval help and guidelines are available on the Website. It is available 24 hours each day, 365 days each year. An electronic copy of this document may also be downloaded from the Office of the Federal Register's Website at <https://www.federalregister.gov> and the Government Publishing Office's Website at www.GovInfo.gov.

Executive Summary

I. Purpose of the Regulatory Action

This final rule updates the national standards for bridge inspections consistent with the provisions of MAP-21 (Pub. L. 112-141, 126 Stat. 405), which included new requirements for a highway bridge inspection program, maintaining a bridge inventory, and reporting to FHWA the inspection results and, in particular, critical findings, meaning any structural or safety-related deficiencies that require immediate follow-up inspection or action. The updated NBIS applies to all structures defined as highway bridges on all public roads, on and off Federal-aid highways, including tribally and federally owned bridges. In addition, NBIS applies to private bridges that are connected to a public road on each end.

Periodic and thorough inspections of our Nation's bridges are necessary to maintain safe bridge operation and prevent structural and functional failures. In addition, data on the condition and operation of our Nation's bridges is necessary for bridge owners to make informed investment decisions as part of an asset management program. Congress declared in MAP-21 that it is in the vital interest of the United States to inventory, inspect, and improve the condition of the Nation's highway bridges. As a

result of this declaration and the authority established by MAP-21 in 23 U.S.C. 144, FHWA is updating the NBIS.

This regulatory action also eliminates two outdated regulations: the Highway Bridge Replacement and Rehabilitation Program (23 CFR part 650, subpart D) and the Discretionary Bridge Candidate Rating Factor (23 CFR part 650, subpart G).

II. Summary of the Major Provisions of the Regulatory Action in Question

This final rule revises the existing NBIS relative to the National Bridge Inventory (NBI), including the requirement to collect element level data for National Highway System (NHS) bridges. The regulations require inspections of bridges on all public roads, on and off Federal-aid highways, including tribally and federally owned bridges, and private bridges connected on each end by a public road. The regulations include several new terms to provide consistency and clarity in the implementation of the regulations. This revision includes renaming some existing terms in a more descriptive way, such as fracture critical member being renamed nonredundant steel tension member (NSTM).

The final rule requires the bridge inspection organizations to maintain a registry of nationally certified bridge inspectors to align with a similar provision in the National Tunnel Inspection Standards (NTIS) in 23 CFR part 650, subpart E. Training requirements for program managers and team leaders have been modified by defining a required amount of refresher training for both roles and defining training needed to be a team leader on a NSTM inspection.

The regulations prescribe the permissible inspection intervals for bridges, including options for more rigorous, risk-based intervals based on the consideration of certain factors. They provide options for establishing inspection intervals for each inspection type. An inspection interval tolerance of 3 months beyond the inspection date is included. Specific criteria have been established to allow for extended routine

inspection intervals up to 48 months, and 72 months for underwater inspections.

Similarly, requirements are described to enable the establishment of more rigorous, risk-based intervals in consideration of certain factors associated with bridges for routine, underwater, and nonredundant steel tension member inspections that would allow some inspection intervals to be up to 72 months.

The final rule requires written reports to FHWA of critical findings identified during inspections and they provide minimum criteria for what a critical finding is, for national consistency. The regulations also require that a bridge inspection organization provide information to FHWA for annual compliance reviews.

The updated regulations include new time frames for updating inventory data, and a process for tracking the updates of inventory data. In addition, they include a new document to identify data items for the NBI. This document, “Specifications for the National Bridge Inventory (SNBI),” replaces the “Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation’s Bridges (Coding Guide).” The final SNBI document is included in the docket.

III. Costs and Benefits

The total cost of the final rule is calculated over the 10-year analysis period (2022 – 2031) assuming that either 30 or 65 percent of eligible bridges will use the Method 1 risk-based 48-month inspection interval rather than the 24-month inspection interval. The total cost savings of the rule for the 10-year study period (2022 – 2031) is between -\$4.6 and -\$195.4 million discounted at 7 percent.

The provisions required by MAP-21 (Sections 650.303, 650.309, and 650.313) have total cost of \$7.1 million over the 10-year analysis period when discounted at 7 percent. The other discretionary provisions that impose costs have a 10-year discounted value of -\$11.7 to -\$202.5 million. The cost savings associated with the provision related

to expanded inspection intervals has a plausible range for 10-year discounted costs of -\$131.0 to -\$321.7 million.

The FHWA believes the final rule will be net beneficial to society but is unable to monetize or quantify the benefits of this rulemaking. More detail on the costs and benefits of the rule can be found later in this document and in the Regulatory Impact Analysis posted to the docket for this rulemaking.

Background and Legal Authority

FHWA bridge inspection program regulations were developed as a result of the Federal-Aid Highway Act of 1968 (Pub. L. 90–495, 82 Stat. 815), which required the Secretary to establish the NBIS to ensure the safety of the traveling public on highway bridges, and directed the States to maintain an inventory of Federal-aid highway system bridges. The Federal-Aid Highway Act of 1970 (Pub. L. 91–605, 84 Stat. 1713) limited the NBIS to bridges on the Federal-aid highway system. The Surface Transportation Assistance Act of 1978 (Pub. L. 95–599, 92 Stat. 2689) extended the NBIS requirements to bridges on all public roads. The Surface Transportation and Uniform Relocation Assistance Act of 1987 (Pub. L. 100–17, 101 Stat. 132) expanded the scope of highway bridge inspection programs to include special inspection procedures for fracture critical members and underwater inspection. Section 1111 of MAP-21 modified 23 U.S.C. 144 by revising the NBIS and adding requirements for a parallel NTIS framework. FHWA adopted procedures for the NTIS via rulemaking on July 14, 2015, at 80 FR 41350. In order to update the NBIS regulations for MAP-21, and to align them with the successful procedures in place for NTIS, FHWA is making a number of changes to 23 CFR part 650.

The framework of this regulation is aligned with the current NBIS framework. Both start with sections discussing the purpose, applicability, and definitions. These are followed by sections on organization responsibilities, qualifications of select personnel,

inspection intervals, and inspection procedures. The current and new regulation end with sections on inventorying bridges, submitting data, and incorporated references. Specific discussions on each section are detailed later.

FHWA is required by 23 U.S.C. 144(h), as amended by MAP-21, to update the NBIS to address the methodology, training, and qualifications for inspectors, as well as the frequency of bridge inspections. In carrying out the MAP-21 provisions, the Secretary is required to consider a risk-based approach to determining the frequency of bridge inspections.

The NBIS is required by 23 U.S.C. 144(h)(2), as amended by MAP-21, to specify the method by which the inspections shall be carried out by the States, Federal agencies, and Tribal governments, or their agents. The NBIS is also required to establish the maximum time period between inspections and the qualifications for those charged with carrying out the inspections. The NBIS requires each State, Federal agency, and Tribal government to maintain and make available to the Secretary, on request, written reports on the results of highway bridge inspections and notations of any action taken pursuant to the findings of the inspections and current inventory data for all highway bridges reflecting the findings of the most recent inspections conducted. The NBIS includes a procedure for national certification of highway bridge inspectors.

A requirement was introduced in 23 U.S.C. 144(d)(2), as amended by MAP-21, for each State and Federal agency to report element level bridge inspection data to the Secretary, as each bridge is inspected, for all highway bridges on the NHS.

The Secretary is required by 23 U.S.C. 144(h)(3)(B), as amended by MAP-21, to establish procedures for States in reporting critical findings relating to structural or safety-related deficiencies of highway bridges and reports on subsequent activities and corrective actions taken in response to a critical finding.

Under the authority delegated to FHWA in 49 CFR 1.85 and the above mentioned statutory authority, FHWA issued a Notice of Proposed Rulemaking (NPRM) on November 12, 2019, at 84 FR 61494. Based on the comments received on the NPRM, FHWA is issuing this final rule to update the NBIS for highway bridges.

Summary of Comments

FHWA received 265 submissions to the docket resulting in more than 3000 individual comments in response to the NPRM. FHWA received comments from the American Association of State Highway Transportation Officials (AASHTO), American Council of Engineering Companies, American Society of Civil Engineers, National Steel Bridge Alliance, American Association for Laboratory Accreditation, 41 State DOTs, the National Transportation Safety Board, 4 Federal agencies, city and county governmental agencies, consulting firms, and individual private citizens. FHWA has considered these comments in the development of the final rule. Docket comments and summaries of FHWA's analyses and determinations are discussed as follows.

Summary of Significant Changes Made in the Final Rule

The final rule was developed in response to comments received on the NPRM. The following paragraphs summarize the most significant of those changes. Editorial or slight changes in language are not addressed in this document.

Section 650.307(f) was revised to require that delegated roles and functions be documented. The proposed NPRM requirement for formal written agreements was removed.

Sections 650.311(a)(1)(ii) and 650.311(b)(1)(ii) were modified to allow a special inspection in lieu of routine or underwater inspection reduced interval inspections. This modification provides an option to monitor areas of concern, rather than requiring inspection of the entire bridge at reduced intervals.

Section 650.311(a)(1)(iii) was modified so that the extended routine inspection interval criteria more closely aligns with current FHWA approved extended inspection interval policies.

Section 650.313(q) was revised to change the critical finding condition rating threshold from serious (3) to critical (2) as defined in the 0-9 scale for superstructure and substructure condition ratings in the SNBI. FHWA has also included the Deck Condition and Culvert Condition ratings in these criteria.

Section 650.317(a)(1) was updated to incorporate only specific sections of the “AASHTO Manual for Bridge Evaluation,” Third Edition, (AASHTO Manual) and the 2019 and 2020 Interim Revisions.

Section-by-section Discussion

The final rule was developed in response to comments received on the NPRM. The following paragraphs summarize major comments received and any substantive changes made to each section in the final rule. Editorial or slight changes in language are not addressed in this document. For sections where no substantive changes are discussed, the substantive proposal from the NPRM has been adopted in the final rule.

Section 650.303 Applicability

Thirty-five commenters requested clarification of the definition for a private bridge for determining applicability of this regulation. Three commenters were in support of inspecting private bridges connected to a public road on both ends of the bridge.

FHWA Response: Because of the seamless nature of the transportation infrastructure across the Nation, FHWA believes that 23 U.S.C. 144 is intended to apply to all highway bridges carrying public roads. The inventory and inspection of all highway bridges open to public travel is essential to protect the safety of the traveling public and allow for the efficient movement of people and goods on which the economy

of the United States relies. In certain cases, a public road is connected to a private highway bridge. The applicability of the NBIS to such private bridges is limited to where the public road directly carries the traveling public to the bridge, the public road continues on the other side, and the bridge is open to public travel.

Sixteen commenters indicated there may be State specific legislation restricting access to private property therefore preventing the ability of the State to perform inspections.

FHWA Response: The NBIS requires inspection of certain private bridges; however, it is not a requirement that the inspection be performed by State DOT inspectors. Rather, State DOTs, Federal agencies, and Tribal governments must cause inspections and evaluations of private bridges to be performed in accordance with the NBIS.

One commenter indicated support if the “private bridge” was referring to toll bridges.

FHWA Response: The vast majority of toll bridges identified in the National Bridge Inventory are publicly owned, often by a publicly chartered toll authority; therefore, they are subject to the NBIS. In the case of a privately owned toll bridge, the applicability of the NBIS is limited to where a public road directly carries the traveling public to the bridge, the public road continues on the other side, and the bridge is open to the public travel.

Three commenters requested clarification on the inspection requirements of pedestrian and bicycle bridges.

FHWA Response: The NBIS is only applicable to “highway bridges” located on “public roads.” Bridges that only carry pedestrian and bicycle traffic are not highway bridges and therefore are not subject to the NBIS. Similarly, the NBIS does not apply to railroad, pipeline, or other types of non-highway bridges, sign support structures, high

most lighting, retaining walls, noise barriers structures, and overhead traffic signs. Owners are strongly encouraged to inspect these non-highway bridges and other significant structures.

The FHWA adopts the private bridge portion of this section as proposed in the NPRM without further modification.

Section 650.305 Definitions

AASHTO Manual - The definition of the AASHTO Manual is updated in the final rule to include the sections incorporated by reference. This change reflects the effort that AASHTO has made to limit the provisions needed to implement the NBIS to specific sections. The intent of this effort was to avoid inadvertently creating unnecessary additional requirements on highway bridge owners by incorporating all of the AASHTO Manual as a reference.

Bridge inspection experience – Seven commenters suggested clarifying how much of an inspector's experience should be from performing bridge inspections. Two commenters recommended adding bridge load rating evaluations to the list of relevant bridge inspection experience.

FHWA Response: FHWA recognizes that there are many factors involved in evaluating an individual's bridge inspection experience and believes that the definition allows for some flexibility in this area. The individual's experience must include development of the necessary skills to properly perform NBIS bridge inspections. However, the predominate amount, or more than 50 percent, should come from NBIS bridge safety inspection experience. Other experience in bridge design, bridge load rating, bridge maintenance, or bridge construction may be used to provide the additional required experience. FHWA agrees that load rating experience is valuable and should be considered as acceptable in determining bridge inspection experience. FHWA suggests

that a program manager evaluating an individual's experience for compliance with the requirements for a team leader could consider, among other things, the following factors:

1. The relevance of the individual's actual experience, *i.e.*, has the other experience enabled the individual to develop the skills needed to lead properly a bridge safety inspection.
2. Exposure to the problems or deficiencies common in the types of bridges being inspected by the individual.
3. Complexity of the structures being inspected in comparison to the knowledge and skills of the individual gained through their prior experience.
4. The individual's understanding of the specific data collection needs and requirements.
5. Demonstrated ability, through some type of a formal certification program, to lead bridge safety inspections.
6. The level of oversight and supervision demonstrated by the individual in prior experience.

Complex feature – Three commenters liked the definition change from complex bridge to complex feature since it placed the focus on portions of the bridge which are complex, while one commenter expressed concern the change will result in more complex inspections.

FHWA Response: FHWA agrees the change will place the focus of these types of inspections on the parts of bridges that warrant additional attention due to their inherent complexity, rather than an entire bridge that may have many other noncomplex elements and are addressed during routine inspections. FHWA does not anticipate an increase in complex inspections as a result of the change. Owners will have the ability, as they do now, to identify any complex feature beyond those in the regulation. The regulation is

only clarifying that the focus of this inspection type is on the complex features, not the entire bridge.

Damage mode – Two commenters recommended clarifying the definition of damage mode by changing it to “deterioration mode” as deterioration is a more common defect than damage.

FHWA Response: FHWA agrees that use of deterioration mode would be a better description for use in determining risk-based inspection intervals. The definition has been changed in the final rule from damage mode to deterioration mode. Also, the definition was modified to include damage and deterioration.

Initial inspection – One commenter questioned how the initial inspection is a separate inspection as identified in § 650.313, but the proposed definition identifies the initial inspection as the first routine, underwater, or NSTM inspection.

FHWA Response: FHWA agrees that an initial inspection is a separate inspection type and the definition was modified to clarify this distinction in the final rule.

Inspection date - One commenter stated the NPRM specifies that the inspection date is the date the inspection begins for a bridge, but that expectations for the timeframe in which to complete the inspection are unclear and need to be defined. The commenter noted that the proposed change may be reasonable for most bridges but is not reasonable for large, complex bridges that take several months to inspect.

FHWA Response: FHWA agrees that for large, complex bridges it would be better to define the inspection date as the date on which the field portion of the bridge inspection is completed. The definition has been updated to capture the inspection date as the last day of field inspection.

Inspection report - One commenter suggested that the inspection report identify the team leader. Two commenters suggested that the team leader signature should not be required.

FHWA Response: FHWA understands the need to clarify this definition, and that owners have many different methods, including electronic signature, to identify the team leader responsible for the inspection and report. FHWA is modifying the regulation to align with section 2.2 of the AASHTO Manual, which is incorporated by reference. The definition now includes the following language: “identify the team leader responsible for the inspection and report.”

Legal load rating - In response to comments for inspection interval criteria in § 650.311(a)(1), FHWA added a new definition to the final rule for legal load rating, which is a term used in the Load and Resistance Factor Rating method.

Nonredundant member - Two commenters questioned why there was a definition in the NPRM for nonredundant member. Two commenters suggested adding a definition for NSTM. Two commenters suggested adding internal and system redundancy to the definition for nonredundant member in accordance with the AASHTO guide specification. Six commenters suggested the move away from the term fracture critical (FC) is unnecessary and will cause confusion. Two commenters stated replacing the FC terminology is beneficial because it avoids the mistaken assumption that a bridge under the FC or fracture critical member categories are dangerous and should not be used.

FHWA Response: The NPRM utilized the term “nonredundant member” in critical findings criteria and to support the definition of “nonredundant steel tension member inspection.” Based on comments received, the criteria for critical findings has been modified in the final rule and criteria related to the term “nonredundant member” has been removed, eliminating the need for this definition.

FHWA agrees with adding a new definition for NSTM in the final rule to provide clarity in implementation of the regulation and moving away from the term “fracture critical” as it is commonly misunderstood to those not familiar with the NBIS. As explained in the NPRM, replacing the general term of “fracture critical member” with a

more descriptive term of NSTM is necessary to enable the risk-based approach to determining the frequency of inspection required by 23 U.S.C. 144(h)(7). Accordingly, a definition for NSTM has been added to the final rule that includes consideration of system and internal redundancy.

FHWA agrees that primary members without load path redundancy but with system or internal redundancy as demonstrated through a nationally recognized process do not require NSTM inspections. Nationally recognized means published in a peer-reviewed engineering journal; or developed, endorsed and disseminated by a national organization with affiliates based in two or more States; or currently adopted for use by one or more State governments or by the Federal Government; and is the most current version. Also, definitions for load path, system, and internal redundancy have been added to the regulation for clarity. The requirement for demonstration of system and internal redundancy has been added to § 650.313(f). Comments on this topic are addressed under that section.

Operating rating - Three commenters suggested the definition for operating rating should more closely align with the AASHTO Manual.

FHWA Response: FHWA agrees the definition should better align with the AASHTO Manual and has updated the definition accordingly.

Plan of action (POA) - Two commenters recommended changing name of “plan of action” to “scour plan of action” to make it clear that this term only applies to bridge scour.

FHWA Response: FHWA agrees with this recommendation and has changed the term to “scour plan of action” to clarify it is only related to scour.

Private bridge - 35 commenters requested the addition of a definition for private bridge.

FHWA Response: A definition has been added to the final rule for private bridge.

Professional engineer (PE) – Four commenters requested that licensed structural engineers (SE) be considered qualified for program manager, team leader, and be responsible for load ratings in lieu of a PE.

FHWA Response: FHWA agrees that SEs who practice in the fields in which they are qualified would have acceptable credentials. The definition has been updated to acknowledge SE licensure.

Program manager - Two commenters supported the definition change to allow for multiple program managers. One commenter stated that their organization and other States are set up so that the program manager does not directly oversee load rating engineers. The commenter noted that since these two employees/positions are not interchangeable, and both have completely different skill sets and responsibilities, this would result in non-compliance. In addition, some commenters questioned whether a program manager would be required to be a PE if responsible for load ratings.

FHWA Response: Because of the issues identified by the commenters that some States do not have load rating engineers and the program manager under the same office, the responsibility for load rating was removed from the definition of program manager. FHWA clarifies in the final rule that the program manager has the overall responsibility to ensure conformity with the NBIS.

Rehabilitation – One commenter suggested adding a definition for rehabilitation, as it is used in multiple places in the regulation but is not defined, though the commenter did not suggest a particular definition.

FHWA Response: FHWA agrees that adding a definition to the final rule will provide clarity to what is considered rehabilitation for NBIS as use of the term varies by owners. This new definition is consistent with the SNBI. Rehabilitation typically includes deck or superstructure replacement, structure widening, or major modification to substantial portions of the bridge.

Routine inspection – One commenter suggested that the definition of routine inspection should not include the identification of critical findings because they can be identified in any type of inspection.

FHWA Response: FHWA agrees that critical findings can be identified in other inspection types. It was not the intent to require a routine inspection to determine a critical finding. The definition has been modified by removing the term critical finding and adding language from the existing regulation about ensuring that the structure continues to satisfy present safety requirements.

Routine permit load – One commenter questioned the need for this definition. Another commenter similarly asked about the intent of this definition and raised concern that it might interfere or restrict a State's ability to control permit movements.

FHWA Response: The NPRM proposed to use the same definition used in the existing NBIS regulation. The definition makes clear what is considered a routine permit in support of § 650.313(k). The requirement to load rate routine permit loads has not changed from the current NBIS to the final rule. This requirement ensures the safety of the travelling public by verifying that permit vehicles can safely cross the bridge, and is not intended to interfere or restrict States' use of routine permits.

Safe load capacity – One commenter stated safe load capacities are typically not being redone after each inspection and expressed concern that the definition implies that the load rating is only safe until the next inspection.

FHWA Response: The definition is the same definition used in the AASHTO Manual. Sections 2.2.7 and 4.2.5 of the AASHTO Manual indicate that load ratings are to be updated as needed to reflect changes in the condition, configuration, strength of members, or changes in loads. Owners should verify load ratings are still valid after each inspection to meet this requirement. It is not uncommon for bridge load rating to be valid for multiple inspection cycles.

Scour appraisal -- One commenter requested FHWA define “evaluation process” and clarify whether the intent is for the analysis to be performed in accordance with Hydraulic Engineering Circulars, (HEC).

FHWA Response: FHWA has modified the definition of scour appraisal to clarify that a scour evaluation or scour assessment is to be used to complete the scour appraisal. Definitions for scour evaluation and scour assessment are added in the final rule to support the scour appraisal definition. The final rule clarifies that scour appraisals are to be consistent with the HEC documents.

Scour assessment -- A definition has been added for scour assessment, which is a risk-based process that considers stream stability and scour potential.

Scour evaluation -- A definition for scour evaluation has been added, which is the application of hydraulic analysis to estimate scour depths.

Service inspection – Six commenters stated that the definition is ambiguous which can lead to interpretations which do not meet the intent. These commenters requested that the qualifications and intent of service inspections be clarified.

FHWA Response: The definition has been updated to clarify the intent is to identify major deficiency and safety issues performed by bridge maintenance or inspection staff. This type of inspection does not require a team leader. The inspections are meant to be performed by bridge maintenance or inspection staff from the ground and are not intended to be as rigorous as routine inspections. Bridges that would require a service inspection are bridges with inspection intervals greater than 48 months, so the bridges would be classified as in good condition and classified in a lower risk category.

FHWA utilized NCHRP Report 782 – Proposed Guideline for Reliability-Based Bridge Inspection Practices¹ in the development of this definition.

Underwater Bridge Inspection Training - One commenter indicated that there is very little inspection material related to the underwater inspection of bridges.

FHWA Response: FHWA has amended the definition of underwater bridge inspection training to include reference to the publication Underwater Bridge Inspection (FHWA-NHI-10-027). The purpose of this manual is to provide guidelines for underwater bridge inspection; acquaint those responsible for bridge safety with underwater inspection techniques and equipment; and present commonly found defects. It should be of interest to bridge and maintenance engineers, divers, and inspectors.

Underwater bridge inspection diver - One commenter suggested a definition be added for underwater bridge inspector diver as it is not defined in the regulation.

FHWA Response: FHWA agrees with this comment and a definition has been added to clarify who is considered an underwater bridge inspection diver. This language also clarifies that a tender and safety diver are not considered underwater bridge inspection divers.

Unknown Foundations – After addressing comments related to scour plans of action, FHWA realized providing a definition for unknown foundations further clarifies the regulation and will lead to consistent implementation. The definition was developed based upon previous FHWA guidance, Frequently Asked Questions – Bridges over waterways with unknown foundations and Geotechnical Engineering Notebook GT-16, Determination of Unknown Subsurface Bridge Foundations.²

¹ The NCHRP Report 782 may be found at the following URL:
<http://www.trb.org/Publications/Blurbs/171448.aspx>

² The Frequently Asked Questions – Bridges Over Waterways with Unknown Foundations may be found at the following URL: <https://www.fhwa.dot.gov/unknownfoundations/090603.cfm>, and Determination of Unknown Subsurface Bridge Foundations can be found at the following URL: <https://www.fhwa.dot.gov/unknownfoundations/090603.cfm>.

Section 650.307 Bridge inspection organization responsibilities

General Comments

Two commenters were concerned that § 650.307(a), (b), and (c) contradict each other and, as written, would require inspection and reporting of a single bridge by multiple agencies.

FHWA Response: Section 650.307(a) states that a State DOT is only responsible for all highway bridges that are located within their State's boundaries, except for those that are owned by Federal agencies and Tribal governments. Section 650.307(b) and (c) identify the bridges that are under the responsibility or jurisdiction of Federal agencies or Tribal governments and aligns with the language in the current regulation. The bridge inspection and reporting responsibility of a bridge falls within one agency (State DOT, Federal, or Tribal).

One commenter stated that removing the term "public roads" from § 650.307(a) and (b) creates inconsistency with § 650.303, where the NBIS applies to all highway bridges located on all public roads.

FHWA Response: FHWA believes that both §§ 650.303 and 650.307 complement each other; accordingly, FHWA does not believe removing the term public roads from § 650.307 creates any inconsistencies with § 650.303. Section 650.307(a) and (b) outline the responsibilities of States and Federal agencies respectively, whereas § 650.303 outlines the applicability of the standards.

Section 650.307(d)

Twenty-two commenters expressed their support for written agreements for border bridges, but stated that only one agency should be responsible for submitting border bridge data to FHWA.

FHWA Response: The National Performance Management Measures, 23 CFR part 490, Subpart D, requires all border bridges to be included with State NBI data

submissions. Bordering States submit border bridge information because they are both responsible for that bridge in their performance measure statistics. In response to the comment, the SNBI has been modified to identify the Designated Lead State that is responsible for submitting a full bridge record, and the Neighboring State will submit an abbreviated bridge record.

One commenter stated that they have two sister bridges that are owned and maintained by a local agency and cross a river with a bordering State. The commenter asked for clarification and whether these bridges fall into this category.

FHWA Response: In the scenario described, one written agreement between the three entities (the two State DOTs and the local owner) to delineate the responsibilities of each entity would be required. This agreement may also include the delegation requirements between the State DOT and local agencies in § 650.307(f).

One commenter asked whether the border bridge agreement should include both maintenance and inspection responsibilities rather than just “inspection” responsibilities.

FHWA Response: FHWA encourages that a border bridge agreement include not just NBIS inspection responsibilities, but all aspects involved with the bridge such as maintenance and financing. However, § 650.307(d) only pertains to determining NBIS inspection responsibilities.

One commenter questioned the need for a joint written agreement.

FHWA Response: FHWA’s experience is that in some instances there has not been a clear delineation of the inspection responsibilities of border bridges. The lack of a clear delineation of inspection responsibilities can lead to undue delays in conducting and completing the required inspections, and in the overall management of the bridge. To align the NBIS process with that of the existing requirements in the NTIS, this language requires the affected agencies to have a written agreement in place to clarify the NBIS-related responsibilities of each entity for that particular bridge and help ensure that timely

bridge inspections and follow-up actions are accomplished in accordance with these standards. Section 650.307(d) addresses the bridge inspection responsibilities of jointly owned bridges that involve bordering States or combinations of State DOTs, Federal agencies, or Tribal governments ownership, or different entities within a State, or Federal, or Tribal jurisdiction.

Section 650.307(e)

Twenty commenters expressed concern about the requirement for State DOTs to maintain a registry of nationally certified bridge inspectors and most suggested that FHWA assume the responsibility of maintaining such registry.

FHWA Response: FHWA believes it is important for each State DOT, Federal agency, or Tribal government to maintain their own specific registry of certified inspectors who perform or have performed inspections on their bridges. This requirement is consistent with the NTIS regulation. There are many reasons that each State should maintain its own registry. Recognizing that Federal regulations represent the minimum standards and that, in many instances, State DOT requirements exceed that of Federal regulations, maintaining a registry of qualified inspectors by State DOTs would be more appropriate. The registry can be used to communicate with inspectors who work in that State to announce such things as anticipated work, training requirements, and training opportunities. State specific requirements for inspectors can be incorporated, and data quality is more easily maintained at the State level. For clarity and consistency with the NTIS, the word “central” was removed in the final rule.

Several commenters asked if FHWA would assign a unique inspector identifier if each inspector would have their own number to be used in any State.

FHWA Response: FHWA will not assign a unique inspector identifier. The minimum requirements for the registry include a method to identify positively each inspector. The method is left to the State to determine. For example, a State may use a

unique numbering system or naming convention as an element of identification method of qualified inspectors within their respective State.

Several commenters stated that they are currently maintaining or able to maintain a State based registry with State specific requirements. Some of these commenters indicated that they would not be aware of specific requirements in other States and would not be able to provide information on whether an inspector qualified in their State would also be qualified in another. Other commenters indicated that individual States do not have governance for bridge inspectors in other States. Some of these commenters stated that there is a likelihood of significant redundant work in certifying consultant inspectors by multiple States.

FHWA Response: The NBIS does not require State DOTs, Federal agencies, or Tribal governments to share their registry of nationally certified bridge inspectors with other entities, nor does it require reciprocity between entities for these registries. The requirement of the registry is for each State DOT, Federal agency, and Tribal government to identify those inspectors that meet the minimum national qualification and perform bridge inspections work in their jurisdiction, as defined in § 650.307(a), (b), and (c). FHWA recognizes that in some instances, qualification for bridge inspectors may exceed the minimum standards, resulting in a qualified team leader in one entity not being qualified in another.

Nine commenters expressed concerns about the requirement to maintain information about adverse actions that may affect the good standing of bridge inspectors. Some asked for clarification and others recommended the removal of this requirement.

FHWA Response: FHWA believes adverse actions indicate an inability of a bridge inspection team leader to perform quality inspections in accordance with the NBIS. As such, including detailed information in the registry about adverse actions is intended to ensure that the ability to perform assigned inspection activities is not in

question. Only adverse actions that occur within the State DOT, Federal agency, or Tribal government's jurisdiction are intended to be included in their own registry. The level of detail to be included in the registry is left to the judgment of the program manager.

One commenter requested clarification as to whether the documentation requirements for inspection intervals of less than 24 months are for individual bridges or on a general inventory level for all bridges.

FHWA Response: The requirement is to document the criteria for inspection intervals for the several inspection types identified in § 650.311. Section 650.307(e)(3) is clarified by adding the term "criteria."

Section 650.307(f)

Fifteen commenters expressed disagreement with formal written agreements citing additional undue burden placed on agencies. Some of the commenters indicated that States already delegate these responsibilities to local governments by State law or through their bridge inspection policies and further stated that requiring a formal written agreement would be a substantial burden.

FHWA Response: FHWA NBIS compliance reviews have shown that, in some situations, delegated agencies do not have a full understanding or commitment to performing the NBIS functions that are delegated to them. FHWA understands the concerns raised about the potential administrative burden of formal written agreements. As such, § 650.307(f) has been revised to replace "formal written agreement" with the requirement that delegated roles and functions must be documented in State DOT, Federal agency, or Tribal government bridge inspection policies. It is essential that all parties involved have a clear understanding of what bridge inspection functions are being delegated. Ultimate responsibility for the inspection of highway bridges rests with the delegating State DOT, Federal agency, or Tribal government.

Several commenters expressed confusion regarding the concept of multiple agency program managers in §§ 650.305 and 650.307.

FHWA Response: FHWA has reconsidered its position on multiple program managers, reverting to requiring a single lead program manager as required in the current regulation. With this revision to the final rule, a State DOT, Federal agency, or Tribal government may have more than one individual with program manager responsibilities. But to alleviate confusion with the intent of the regulation, there must be one individual who has the overall responsibility for the program. The intent is that the program manager provides overall leadership and guidance for the inspection organization, and is available to inspection teams and load rating personnel to provide guidance.

Section 650.307(f) and (g)

The NPRM language made clear that a Tribal government may delegate its responsibilities under this subpart to Bureau of Indian Affairs (BIA), if BIA agrees, resulting in BIA acting as the program manager for the Tribes. However, FHWA's Federal Lands Highway (FLH) Office also can be delegated responsibilities to act as program manager for Tribes under the Tribal Transportation Program Agreement. FHWA has been carrying out these responsibilities for FHWA Agreement Tribes since 2019. Language has been added to clarify that these delegations to FHWA continue to be permissible under these regulations and to correct this oversight in the NPRM language. A Tribal government that does not delegate its responsibilities to BIA or FHWA continues to need to maintain a bridge inspection organization.

Section 650.309 Qualifications of personnel

Section 650.309(a)

Two commenters stated that program managers should be a licensed PE because they are responsible for load ratings. One commenter stated their organization and other States are set up so that the program manager does not directly oversee load rating

engineers. The commenter noted that since these two employees/positions are not interchangeable, and both have completely different skill sets and responsibilities, this would result in the State being non-compliant.

FHWA Response: FHWA maintains its position on the longstanding success the NBIS has had using program managers qualified by experience in lieu of a PE. Because of the issues identified by the commenter that some States do not have load rating and the program manager in the same office and the positions have different skill sets, the responsibility for load rating was removed from the definition of program manager.

Five commenters suggested that the qualifications for a program manager with PE should also have a minimum of 6 months bridge inspection experience. Two commenters highlighted that a team leader with a PE requires more bridge inspection experience than a program manager.

FHWA Response: FHWA has included the bridge inspection experience requirement for PE team leaders to ensure that all team leaders have some experience and are familiar with the collection and recording of bridge inspection information as well as the process and procedures associated with bridge inspection activities. FHWA encourages program managers to have bridge inspection experience, however the NBIS has had longstanding success with PE program managers. It is not the intent of FHWA to require a program manager also to be a certified bridge inspection team leader. The NBIS provides minimum national standards and organizations can make their standards more stringent than the NBIS.

Four commenters suggested the option for a licensed SE to qualify in lieu of a PE where applicable in § 650.309 for a program manager, team leader, and for load ratings.

FHWA Response: FHWA agrees that licensed SEs who practice in the fields in which they are qualified would have acceptable credentials. The definition of PE in § 650.305 has been updated to acknowledge SE.

Six commenters asked for clarification regarding grandfathering of the training under prior regulations. Twelve commenters raised concern regarding the 24-month timeframe for program managers and team leaders to satisfy qualification requirements for comprehensive bridge inspection and refresher training for individuals serving in those positions under prior regulations. Three commenters expressed that the 60-month interval for obtaining 18 hours of refresher training was too stringent.

FHWA Response: FHWA believes that the minimum criteria established in § 650.309 for program managers and team leaders with respect to comprehensive and refresher training are necessary to ensure that bridge inspectors are qualified to inspect bridges. The 60-month timeframe for refresher training is also consistent with the NTIS. FHWA believes the requirement to complete the training within 24 months of the effective date of the final rule is reasonable.

Several commenters noted that the effective date of the final rule will increase demand for National Highway Institute (NHI) courses.

FHWA Response: Training for bridge inspection is a critical part of the NBIS program and NHI is actively working to revise training to conform with the final rule. Required training will be available shortly after the final rule is published, which should provide sufficient time for all deadlines to be met.

One commenter questioned how the 24-month timeframe to satisfy the training requirements would be enforced.

FHWA Response: The program manager of each State DOT, Federal agency, or Tribal government has the duty and responsibility to ensure the inspection organization is serviced by qualified individuals per § 650.309. FHWA additionally assesses compliance with the NBIS on the national level via the NBIS oversight process per § 650.313(r).

Section 650.309(b)

Eighteen commenters touched on the bridge inspection experience required for team leaders. Most of these comments were on the requirement for team leaders who qualify based on PE licensure also to have 6 months bridge inspection experience. Of the 18 commenters, 6 supported the revision requiring team leaders who qualify based on a PE also to have 6 months bridge inspection experience, and 1 commenter proposed increasing the required experience. Five other commenters were opposed to the experience requirement for PE.

FHWA Response: FHWA believes experience is a very important factor in being a successful team leader. The revision to include the bridge inspection experience requirement will ensure that all team leaders have some experience and are familiar with the collection and recording of bridge inspection information as well as the process and procedures associated with bridge inspection activities. FHWA believes that minimum experience requirements for all team leaders will bring increased national consistency to bridge inspections, evaluations, data collection, and data submission.

Section 650.309(c)

Eight commenters supported the requirement for team leaders of NSTM inspections to successfully complete training on NSTM inspections. Four commenters felt the new requirement was not necessary for various reasons such as the additional cost to get personnel trained, the difficulty in getting in-State NHI training, or that the training might be valuable for more complex or larger NSTM bridges but was not needed for simpler NSTM bridges such as short span truss bridges. Three commenters pointed out that the proposed rule made no allowance for grandfathering NSTM (Fracture Critical Member) training which was completed under prior regulations.

FHWA Response: FHWA believes the variability and complexity of structures with NSTMs requires training that will bring national consistency to NSTM bridge inspections, evaluations, and data collection/submission. It is important to ensure that

team leaders of NSTM inspections possess the higher level of training commensurate with the importance of these members. FHWA acknowledges that some organizations will have some additional burden related to training, but many team leaders have already completed the training even though it was not required. The final rule has been updated to clarify that completion of FHWA-approved NSTM training (ex. FHWA-NHI-130078) under prior regulations satisfies this new requirement, which will reduce the burden.

Section 650.309(e)

Three commenters asked if divers who completed the underwater bridge inspection diver training under prior regulations would be deemed to have satisfied the requirement to complete the diver training proposed in the NPRM. Two commenters suggested a timeframe of 24 months to satisfy the qualification requirement if serving as an underwater bridge inspection diver under prior regulations.

FHWA Response: The changes proposed in the NPRM were not intended to require underwater bridge inspection divers who qualified under prior regulations to requalify. FHWA has clarified in the final rule that completion of FHWA-approved comprehensive bridge inspection training or FHWA-approved underwater bridge inspection training under prior regulations satisfies the requirement in § 650.309(e). Given this clarification, there is no need to set a timeframe to satisfy requirements for individuals who qualified as underwater bridge inspection divers under prior regulations.

One commenter highlighted the need for a definition of an underwater bridge inspection diver.

FHWA Response: FHWA agrees that adding a new definition for underwater bridge inspection diver in the final rule will clarify who is required to have the training. The regulation clarifies the required training for an underwater bridge inspection diver applies to personnel performing the physical inspection of the underwater portion of the bridge. Non-inspection personnel supporting the underwater bridge inspection diver,

such as the tender or safety diver, are not required to meet the requirement of § 650.309(e).

Two commenters pointed to the potential challenge to complete the underwater bridge inspection training because the course is not offered very often and generally there are not enough people to meet NHI's 20-person minimum class size.

FHWA Response: Because of the new requirement, FHWA anticipates more demand for this course. FHWA encourages States that do not have enough demand to partner with other agencies, States, or entities to meet the minimum class size.

Section 650.309(f)

Three commenters indicated they use team leaders for all inspections and questioned the need to establish separate qualifications for the Damage, Special, and Service Inspection types. One commenter recommended FHWA clarify the minimum expectations for personnel performing these inspections.

FHWA Response: FHWA is intentionally not establishing minimum qualifications for personnel performing Damage, Special, or Service Inspection types. Inspection protocols and qualifications for these inspection types can vary widely between States, Federal agencies, and Tribal governments. FHWA is providing flexibility to bridge inspection organizations for determining the personnel to be used. FHWA believes bridge inspection organizations are in a better position to determine qualifications based on the way they conduct work related to these inspection types. This section provides agencies and governments the flexibility to establish personnel qualifications with a focus on ensuring safety of the traveling public under their jurisdiction. An inspection organization should have an appropriate process in place to be able to verify and ensure that individuals performing these types of inspections are qualified per organizational requirements.

Section 650.309(g)

Three commenters questioned the need for adding the new “Service Inspection” type.

FHWA Response: Written personnel qualifications for the Service Inspection type are only required for agencies that establish inspection intervals exceeding 48 months for routine inspections per §§ 650.311 and 650.309(g). FHWA utilized NCHRP Report 782³ – Proposed Guideline for Reliability-Based Bridge Inspection Practices in the development of this inspection type. The service inspection type is defined in § 650.305. These provisions provide flexibility to bridge inspection organizations for determining the personnel to be used.

One commenter noted that there is no consideration for performance-based qualifications for inspectors using unmanned aircraft systems (UAS). The commenter recommended performance requirements to ensure there is sufficient training and testing for accuracy, visual acutance, image quality, and documentation involving the use of UAS for inspections.

FHWA Response: UAS are a tool to access visually hard to reach areas of a bridge. UAS operators in both the public and private sectors must adhere to statutory and regulatory requirements. Public aircraft operations (including UAS operations) are governed under the statutory requirements for public aircraft established in 49 U.S.C. 40102 and 40125. A bridge inspection team leader is required to be on site for the duration of the bridge inspection and is subject to the requirements as outlined in this final rule. The requirements for a routine inspection that includes a UAS-assisted visual inspection are the same as a standard visual inspection. FHWA has been researching opportunities for the appropriate use of UAS in the bridge inspection program and

³ The NCHRP Report 782 may be found at the following URL:
<http://www.trb.org/Publications/Blurbs/171448.aspx>

monitoring the research of others. FHWA will continue to look for opportunities and integrate these tools when it is believed they will contribute to the continued success of the bridge inspection program.

Section 650.309(h)

Five commenters raised concern for the proposed requirement that instructors of alternate training courses meet program manager or team leader qualifications, because valuable supplemental instruction may come from hydraulic engineers, structural engineers, load raters, software personnel, construction staff and others.

FHWA Response: FHWA has reconsidered its position for instructors of alternate training and has removed this requirement from the final rule. The intent of the qualifications requirement was to ensure knowledgeable personnel teach the course. FHWA agrees valuable supplemental instruction may come from hydraulic engineers, geotechnical engineers, structural engineers, load raters, software personnel, construction staff, and others. Removing instructor qualification requirements from the final rule is also consistent with the NTIS.

Fourteen commenters stated that further clarification is needed on the FHWA approval process of alternate training and how NHI materials will be made available. Several commenters requested clarification regarding grandfathering of NHI and FHWA-approved training per prior regulations.

FHWA Response: The regulation provides two options for acceptable bridge inspection training. The purpose of the options is to provide flexibility and consistency in the delivery of training. The first option is the approved NHI training courses identified in the NBIS, and the second option allows for State, federally-, and tribally-developed training courses. For the second option, FHWA outlines that alternate training materials and end-of-course assessments must include all the topics from the NHI courses and be submitted to FHWA for approval. FHWA intends to make NHI bridge inspection

course materials available to State DOTs, Federal agencies, and Tribal governments through a formal written agreement in accordance with applicable requirements. The written agreement will establish controls on use of the material and the qualifications of those who deliver the training.

For agencies that have existing FHWA-approved alternate training, the NBIS requires that agencies review and update the prior approved training materials and resubmit for FHWA approval to ensure the training satisfies the requirements as defined in §§ 650.305 and 650.309. FHWA has revised § 650.309(h)(3) from the proposed regulation to clarify the requirements. Agencies may have the need to train personnel during the 24-month transition period and before they are able to revise fully prior approved materials and obtain FHWA approval. During the 24-month transition period, existing FHWA-approved training (*i.e.*, approved by FHWA prior to the effective date of the final rule) can still be used to train inspection personnel. Bridge inspection organizations will also have available to them the opportunity to schedule NHI training to meet the training requirements.

One commenter suggested that FHWA maintain a registry of all acceptable FHWA-approved (non-NHI) bridge inspection training that fulfill the requirements as outlined in the new regulation, to include various State, federally-, and tribally-developed training courses; the commenter noted this might streamline approval of inspector training qualifications when individuals seek employment in different States.

FHWA Response: FHWA agrees that maintaining a list of approved non-NHI courses could be beneficial for owners and individuals who need training. FHWA will continue to consider this suggestion, but does not believe it to be appropriate to include in the final rule as training is just one component of the qualifications requirements. State DOTs, Federal agencies, and Tribal governments are responsible to ensure all qualifications are met.

Section 650.311 Inspection interval

General Comment

There were numerous comments on risk-based inspection intervals in § 650.311 of the NPRM. As background and support of FHWA responses to NPRM comments, the following is an overview of the basis and approach FHWA used in the NPRM and this final rule.

In accordance with 23 U.S.C. 144(h)(7), FHWA has outlined a risk-based processes for determining the frequency of bridge inspections. There are two different options for State DOTs, Federal agencies, and Tribal governments to determine the inspection interval. Method 1 offers a simplified assessment approach, while Method 2 offers a more rigorous assessment methodology to determine inspection intervals. The methods for establishing risk-based intervals are based on the NCHRP Report 782 Proposed Guideline for Reliability Based Bridge Inspection Practices⁴ and FHWA's current practice for establishing 48-month inspection intervals.

Bridges typically exhibit structural deterioration in a controlled and stable manner over time; therefore, risk is considered an effective measure upon which to base the interval of inspections. When risk grows, bridges should be inspected more often, and when risk is reduced, bridges may be inspected less often. The process for identifying risk-based intervals involves the identification and use of an interval that is commensurate with the risk of safety or service loss in a given bridge. It provides additional flexibility to bridge inspection organizations by applying their experience and engineering knowledge to determine the use of limited resources in a more optimal way across their inventory. The general framework and process for assessment of risk

⁴ The NCHRP Report 782 may be found at the following URL:
<http://www.trb.org/Publications/Blurbs/171448.aspx>

provides bridge inspection organizations the latitude to exercise their interpretations to determine probability, consequence, and risk for bridges in their inventory. The intent of the rule is not to mandate the application of the rigorous risk-based approach to an entire inventory, although it is an option. Rather, the final rule allows State DOTs, Federal agencies, and Tribal governments to use Method 1 or Method 2 to determine the inspection interval for each type of inspection and for each bridge.

Section 650.311(a)

Sixteen commenters stated that a complete routine inspection for serious but localized conditions is unnecessary and would result in excessive costs, a waste of public resources, and unnecessary impacts to traffic. They stated that special inspections are typically used to monitor areas of concern between routine inspections and suggested that the regulation be revised to allow the use of special inspections.

FHWA Response: FHWA agrees that special inspections are appropriate in certain situations. Sections 650.311(a)(1)(ii) and 650.311(b)(1)(ii) of the final rule are revised to allow a special inspection limited to monitoring localized deficiencies and, in accordance with § 650.313(h), in lieu of a full routine inspection or full underwater inspection when one or more condition ratings are coded three (3) or less due to those localized deficiencies.

One commenter requested that FHWA explicitly state that either the simplified (Method 1) or the rigorous (Method 2) assessments of risk may be used, or that a mix of both methods may be used to determine inspection intervals. Another commenter stated that the flexibility would be beneficial, particularly since it will take States time to determine the best approach to determining inspection intervals.

FHWA Response: The final rule allows the State DOT, Federal agency, or Tribal government to use Method 1 or Method 2 to determine the inspection interval for each type of inspection and for each bridge. This flexibility allows for the better allocation of

inspection resources in consideration of risk. The SNBI has an item for recording which method is being used for each type of inspection for each bridge.

Fifteen commenters criticized the Method 2 approach of determining risk-based intervals for routine, underwater, and NSTM inspections as “complicated,” “cumbersome,” “difficult,” “confusing,” “subjective,” “resource intensive,” and “unable to implement.” One commenter expressed concerns that Method 2 would result in more frequent inspections and added cost burden. Five commenters expressed support and one commenter expressed strong support for Method 2.

FHWA Response: State DOTs, Federal agencies, and Tribal governments may utilize Method 1 or Method 2 to establish inspection intervals. FHWA utilized NCHRP Report 782 – Proposed Guideline for Reliability-Based Bridge Inspection Practices⁵ as a nationally recognized approach in the development of the optional Method 2. The FHWA believes the level of consideration and rigor identified in the underlying research are appropriate to maintain adequate highway bridge safety for intervals of inspection determined using this method. Several State DOTs have explored how to incorporate this approach in the current regulation and FHWA disagrees that it cannot be implemented. The Method 2 approach is intended to allow for better allocation of limited program resources; it is not intended as only a means for cost savings or reduced inspections. FHWA believes that the cost of development and management of the Method 2 approach will provide improvements in resource allocations and safety as described in the RIA.

Two commenters stated that requiring a bridge with a deck condition of three (3) or less to be inspected every 12 months is excessive for little gain.

⁵ The NCHRP Report 782 may be found at the following URL:
<http://www.trb.org/Publications/Blurbs/171448.aspx>

FHWA Response: FHWA believes bridge decks rated in serious condition, as with other major bridge components, necessitate more frequent monitoring to protect public safety until corrective actions are taken.

Two commenters suggested that the 12-month interval criteria should be a condition rating of a four (4) or less for deck, superstructure, substructure, or culvert. One of the commenters, an inspector, stated that 24-months between routine inspections on bridges in poor condition is too long. The other commenter stated that a case can be made for a condition of four (4) or less on high traffic roads such as State highways.

FHWA Response: FHWA agrees that there may be other cases that could suggest shorter intervals between inspection. The rule defines the minimum cases for which FHWA requires 12-month interval; additional criteria to determine intervals, considering factors including condition ratings and known deficiencies, must also be developed and documented.

One commenter stated that the 12-month interval criteria condition code of 3 is too conservative for all bridges and suggested that the determination of inspection intervals should be left to the judgement of the agency and program manager. Another commenter stated that they have an objective method to determine when inspection frequencies less than 12 months are required and do not need further constraints on their inspection cycles.

FHWA Response: FHWA disagrees and has established minimum criteria to maintain a uniform level of safety.

Eight commenters expressed confusion or requested clarification regarding the new SNBI Scour Condition Rating item and how it would be used in setting routine and underwater intervals. One of the commenters had concerns about bridges with unknown foundations requiring 12-month inspection intervals. Another of the commenters suggested a scour critical bridge POA alone should dictate the inspection interval.

Another commenter was concerned about requiring a 12-month interval because a bridge is coded as scour critical.

FHWA Response: Both § 650.311(a)(1)(ii) and (b)(1)(ii) use the new SNBI Scour Condition Rating item as criteria for determining reduced routine and underwater inspection intervals. This is a new item that is only based on observed scour; it is not equivalent to the Coding Guide's Item 113. Therefore, whether a bridge has been appraised as scour critical or the foundation is unknown has no effect on the inspection intervals required. The criteria for reduced intervals in both sections is for a condition rating of three (3) or less. The SNBI defines a rating of three (3) as serious or worse condition, meaning that major scour exists and the strength and/or stability of the bridge is seriously affected, typically necessitating more frequent monitoring, load restrictions, and/or corrective actions.

Seven commenters stated that the criteria in § 650.311(a)(1)(ii)(C), "Details, loading, conditions, or inspection findings that are known to affect the performance of the bridge or its elements within the next 24 months," is vague and unknowable. Two commenters suggested adding the word "safe" before "performance," and one suggested replacing the word "known" with "expected."

FHWA Response: FHWA agrees that the phrase is vague and it has been removed from the criteria.

One commenter was concerned that the Method 1 routine criteria has too many constraints, making the method too conservative and not worthwhile.

FHWA Response: FHWA believes minimum constraints are necessary to maintain consistency in the levels of inspection. The Method 1 criteria has been revised to be simpler, to align better with current extended frequency policy, and to relate more directly to SNBI items.

Twenty-nine commenters stated that the proposed Method 1 NBI routine inspection condition code of seven (7) or greater for extended intervals is too restrictive. Many of these commenters explained that this threshold is more restrictive than the current criteria approved by FHWA for extended frequencies, resulting in significantly fewer bridges being eligible for extended intervals than currently approved.

FHWA Response: The extended inspection interval condition criteria has been revised to be based on NBI condition ratings greater than or equal to 6. This change, along with the change to base the load rating factor criteria on the NBI inventory rating with a rating factor value greater than or equal to 1.0 for HS-20 or HL-93, reverts to the criteria currently used for FHWA approval of extended intervals. We anticipate these changes will result in a similar number of bridges being eligible for extended intervals as under the existing regulation. However, the actual number of bridges with extended inspection intervals is expected to increase as FHWA approval is no longer required.

Fifteen commenters suggested that the operating rating or legal load rating factor of 1.1 criteria for eligibility for extended inspection intervals be revised to be based on a rating factor greater than or equal to 1.0. Common reasoning offered is that an operating rating factor of 1.0 indicates that a bridge is already able to carry those loads with a built-in safety factor, that the Load and Resistance Factor operating rating was calibrated to a rating factor of 1.0 at an inspection interval of 5 years, and that requiring a more conservative operating rating provides no added benefit.

FHWA Response: The extended inspection interval load rating factor criteria has been revised to be based on an NBI inventory rating factor of greater than or equal to 1.0. This change, along with the change to the NBI condition rating criteria of greater than or equal to 6, reverts to the criteria currently used for FHWA approval of extended intervals, which we expect to result in a similar number of bridges being eligible for extended intervals as under the existing regulation. However, the actual number of bridges on

extended inspection intervals is expected to increase, as FHWA approval is no longer required.

One commenter proposed that the routine 48-month interval load rating criteria in § 650.311(a)(1)(iii)(C) be tied to the SNBI Routine Permit Loads item.

FHWA Response: FHWA agrees with the comment, as the tie to the SNBI Routine Permit Loads item was intended. The § 650.311(a)(1)(iii)(C) criteria has been revised to require that SNBI Routine Permit Loads, item B.LR.08, be coded either an A for load capacity is adequate for all routine permit loads, no routine permit loads are restricted, or N for bridge does not carry routine permit loads, agency does not issue routine permits.

One commenter stated that there are steel bridges with AASHTO category E and E' fatigue details that have performed safely for more than 50 years and that restricting inspection intervals based on those details alone does not reflect a realistic consideration of risk. Another commenter suggested that the steel bridge detail criteria should eliminate bridges with non-redundant steel tension members.

FHWA Response: The steel bridge fatigue detail criteria for Method 1 extended inspection intervals is intended to be simple and conservative; additional criteria would greatly complicate the determination of the proper inspection interval. For bridges with NSTMs, criteria for determining inspection intervals for those specific NSTM members are provided in § 650.311(c). FHWA realizes this could result in different routine and NSTM inspection intervals for the same bridge, with a 48-month routine interval and a 24-month NSTM interval being common.

Twelve commenters were concerned with the vertical clearance criteria for extended inspection intervals. Some were concerned with not allowing extended intervals for bridges with a history of over height vehicular damage and recommended that this provision be removed, while others were concerned with excluding bridges with

vertical clearances of less than 16'-0" over interstates, freeways, and other arterials, stating that this is more restrictive than currently approved criteria.

FHWA Response: FHWA agrees. The criteria for extended inspection intervals has been revised to remove the criterion that bridges have no history of over height vehicular impact damage and to change the minimum vertical clearance requirement to 14'-0" over all roadways.

Fourteen commenters recommended removal of the substructure material and environment extended inspection intervals criteria, stating that the substructure condition rating is sufficient in determining the inspection interval and that no data exist for the criteria and would be difficult to obtain.

FHWA Response: The substructure material and environment extended inspection intervals criteria has been removed. However, § 650.311(a)(1)(iii)(B) is modified and requires State DOTs, Federal agencies, or Tribal governments that implement extended intervals to develop and document a policy for determining the inspection interval, considering factors including materials and environments.

Four commenters stated that they thought the scour condition code criteria of 6 or greater for extended inspection intervals is too conservative and recommended changing to 5 or greater, with the reasoning that a code of 5 says the strength and stability of the bridge are not affected.

FHWA Response: A scour condition code of 5 is fair, moderate scour. Though the strength and stability of the bridge are not yet affected, FHWA believes an extended interval should not be allowed in such a condition, which is one code away from being severe enough potentially to affect the strength or stability of the bridge, and declines to make the suggested change in the final rule.

Seven commenters stated that the criteria in § 650.311(a)(1)(iii)(I) "Details, loading, conditions, and inspection findings that are not expected to affect the

performance of the bridge or its elements within the next 48 months” is vague or ambiguous and suggested it be removed.

FHWA Response: FHWA agrees that the phrase is vague and inclusion of this criteria did not add essential information contributing to the requirements of this section, so the language has been removed from the final rule.

Two commenters noted that in the definition of risk assessment panel (RAP), the term “expert” is undefined, and the level of collective experience is unspecified. One commenter thought that some clarification would be useful, including education, licensing, and professional work experience in requisite fields in order to rely justifiably on the panels’ judgments on risk assessments and inspection intervals. Another commenter suggested removing the word expert from the definition and replacing it with “well experienced.”

FHWA Response: FHWA agrees with the commenters and has modified the language in the definition of risk assessment panel to use the term “well experienced” in lieu of “expert.” The requirement previously contained in the NPRM definition to require two PEs be part of the panel, has been relocated to § 650.311(a)(2) to better consolidate all requirements of the RAP to one location. Requiring PEs to be part of the panel establishes the professional expectation while providing flexibility for well experienced individuals who may not be PEs. Laws governing PE licensure within each State ensure that PEs only practice engineering in the fields in which they are qualified and experienced.

One commenter stated that the Method 2 process needs to have a timeframe for approval or disapproval.

FHWA Response: FHWA expects to review Method 2 submissions and provide approval in a timely manner. A specific timeframe is not provided, as the complexity of submissions will likely vary quite broadly.

One commenter stated that the regulation language should include “deterioration” modes.

FHWA Response: FHWA agrees and “deterioration mode” has been added to the final regulation.

One commenter stated that the Method 2 approach is resource intensive, difficult to implement, more stringent, and may result in more bridge inspections as compared to current regulations. However, other commenters expressed support.

FHWA Response: This regulation is intended to provide better allocation of limited bridge inspection resources. The Method 2 approach for determining intervals is an option that provides the ability to decide if the cost of development of the risk-based approach is worthwhile in comparison to return in improvements in resource allocations and safety.

One commenter stated that the Method 2 approach does not explain if the interval is set by the highest risk element, and does not explain if different intervals are allowed for different elements.

FHWA Response: It would not be practical or manageable to have different intervals for different members of the bridge, so FHWA will continue to require one interval for the bridge which is governed by the members with the highest risk, as proposed.

One commenter questioned whether 72 months is too long an inspection interval under the risk-based approach outlined in Method 2 of the proposed rule.

FHWA Response: FHWA believes that the regulation in total, including the requirement for FHWA review and approval of the process used to justify a 72 month interval, will provide adequate safeguards for the safety of the Nation’s network of bridges.

One commenter questioned whether timber structures could be included in the Method 2 approach.

FHWA Response: The regulations do not preclude timber structures from Method 2. Common deterioration modes in timber structures should be considered.

One commenter suggested that for deterioration modes in concrete elements, post-tensioning steel should also be included.

FHWA Response: FHWA agrees and has added “prestressing” steel in the final regulation, which is the steel used in both pre-tensioning and post-tensioning methods of fabrication or construction.

Sixteen commenters expressed concerns about the service inspection requirement. Comments were critical of the frequency of the inspection (24 months) and the undefined scope and data collection, and suggested that it defeats the purpose of the Method 2 risk-based approach when going beyond 48 months. One commenter expressed particular concern for service inspection of culverts because this inspection may take just as much effort as a routine inspection.

FHWA Response: The service inspection is needed to identify critical safety issues and can be performed by personnel with general knowledge of bridge maintenance or bridge inspection. It is intended to be much less rigorous and costly as compared to routine inspection. The service inspection has been revised to clarify that only “inspection date and any follow up actions” are required to be documented in the bridge file. Also, the interval has been changed to half of the routine inspection interval when that interval is greater than 48 months.

Section 650.311(b)

Six commenters expressed concern with automatically requiring underwater inspections at reduced intervals for a substructure condition rating of 3 or less, stating that the rating includes above water portions of the substructure. One of the commenters

suggested that the requirement be modified to specify conditions that would be evaluated during an underwater inspection. Another commenter added that the number of bridges impacted would be minimal, but the requirement would cause the additional burden of having to have off-cycle contracts.

FHWA Response: The proposed substructure condition criteria for underwater inspections has been replaced in the final rule with criteria based on the underwater condition. With this change, the reduced underwater inspection interval criteria will only apply to those portions of the bridge evaluated during an underwater inspection. An item has been added to the SNBI to record the underwater condition rating.

Two commenters suggested that underwater components in poor or worse condition should have 12-month inspection intervals, since the likelihood of failure should be identical regardless of whether located above or below water.

FHWA Response: The underwater inspection interval for bridges with underwater components in serious or worse condition has been revised from the proposed rule to not exceed 24-months. This interval is a maximum for those bridges meeting the criteria of § 650.311(b)(1)(ii)(B). State DOTs, Federal agencies, and Tribal governments are additionally required to develop and document supplemental criteria for reduced underwater inspection intervals. FHWA anticipates that the supplemental criteria will often result in this subset of bridges having an interval of 12-months or less.

Two commenters requested that benign environment needed to be defined with more objective language.

FHWA Response: The proposed benign freshwater environment criteria has been removed from § 650.311(b)(1)(iii) in the final rule. However, State DOTs, Federal agencies, and Tribal governments that implement revised § 650.311(b)(1)(iii)(A) are required to develop and document an underwater extended interval policy, which should consider factors including the benign or aggressive nature of the environment.

Two commenters stated that the proposed regulation is too conservative and restrictive for NSTM Inspections, and suggested that intervals of 72 and 96 months should be allowed. The commenters cited research findings by Purdue University⁶.

FHWA Response: FHWA is aware of the cited research, that suggests that greater intervals for NSTMs are possible in low risk cases. This rule provides a step from the currently required 24-month interval toward those greater intervals. This risk-based approach for NSTM intervals will allow for many bridges to move to a 48-month interval, which is substantial relief as compared to current requirements. FHWA will continue to evaluate research in this area and the performance of this step and may consider longer intervals in future regulation.

Two commenters stated that bridges with NSTMs should not be eligible for intervals beyond 24 months.

FHWA Response: FHWA is basing NSTM interval requirements on published research⁷ that suggests that greater intervals for NSTMs are acceptable for low risk cases. Risk is the combination of likelihood and consequence. While the consequence of failure of an NSTM is high, the risk can be mitigated in cases when the likelihood is very low.

One commenter asked about how the new AASHTO Guide Specifications for Internal Redundancy of Mechanically-Fastened Built-Up Steel Members⁸ will be implemented with the new regulations.

⁶ Michael J. Parr; Robert J. Connor; and Mark Bowman, M.ASCE, Proposed Method for Determining the Interval for Hands-on Inspection of Steel Bridges with Fracture Critical Members, may be found at the following URL: <https://ascelibrary.org/doi/10.1061/%28ASCE%29BE.1943-5592.0000057>.

⁷ *Ibid.*

⁸ The AASHTO Guide Specifications for Internal Redundancy of Mechanically-Fastened Built-Up Steel Members, 1st Edition may be found at the following URL: <https://store.transportation.org/Item/PublicationDetail?ID=4149>.

FHWA Response: Section 650.313(f) allows for a State DOT, Federal agency, or Tribal government to demonstrate to FHWA that a member has system or internal redundancy through the use of nationally recognized methods. The AASHTO Guide Specifications for Internal Redundancy of Mechanically-Fastened Built-Up Steel Members⁷ and AASHTO Guide Specifications for Analysis and Identification of Fracture Critical Members and System Redundant Members⁹ are considered acceptable nationally recognized methods for determining system or internal redundancy.

Ten commenters questioned the meaning of “significant corrosion” as it relates to the NSTM inspection interval requirements.

FHWA Response: FHWA agrees that this terminology was vague; the criteria is revised to be based on the NSTM Inspection Condition, a new SNBI item.

One commenter suggested that “fracture prone details” should be considered for reduced NSTM intervals.

FHWA Response: FHWA did not include fracture prone details in the criteria as many of the bridges identified with these details have been, and continue to be, evaluated and, if necessary, retrofitted in accordance with the FHWA July 10, 2001, memorandum¹⁰ on the subject of the Hoan Bridge Investigation. Therefore, FHWA does not believe it is necessary to include in the final rule. State DOTs, Federal agencies, or Tribal governments that are aware of bridges with these details should include such details as a risk factor in the documented reduced interval criteria.

One commenter suggested that “in accordance with the fracture control plan” should be defined.

⁹ [*Ibid.*](#)

¹⁰ FHWA July 10, 2001, memorandum on the subject of the Hoan Bridge Investigation may be found at the following URL: <https://www.fhwa.dot.gov/bridge/steel/010710.cfm>.

FHWA Response: FHWA disagrees that fracture control plan needs to be defined in the regulation as it is a commonly recognized term, which was implemented by AASHTO in 1978, and is well defined.¹¹ The term is used in bridge fabrication and construction to describe elevated material and fabrication requirements applied to NSTMs to reduce the likelihood of fracture.

Two commenters suggested that “details, loading, conditions, or inspection findings that are known to affect the expected performance” is vague.

FHWA Response: FHWA agrees that the phrase is vague. The language is revised in the final rule with the intent that knowledge about unique aspects of the inventory known to affect performance is considered in the development of interval policies. The language has been incorporated in the § 650.311(c)(1)(ii) and (iii) narratives.

Two commenters stated that they prefer the NTIS tolerance – a window for performing inspections – and that the proposed tolerance will result in inspection date creep.

FHWA Response: During the development of the NPRM, FHWA considered using the NTIS tolerance method, which requires a fixed target inspection date to be set and allows a plus or minus 2-month tolerance. However, the NTIS method, unlike the NBIS final rule, does not allow for inspections to be conducted early; this is undesirable for the significantly larger bridge inventory. Therefore, FHWA declines the commenters’ suggestion to use the NTIS tolerance method for the NBIS.

Section 650.311(e)

¹¹ Clause 12 of the AASHTO/AWS D1.5M/D1.5, *Bridge Welding Code*, 6th Edition.

One commenter indicated the 3 month tolerance should not apply to bridges on an interval less than or equal to 12 months.

FHWA Response: FHWA agrees; § 650.311(e) has been revised to reduce the tolerance to 2 months for inspection intervals of less than 24 months.

Two commenters were concerned that it is not usually possible to know of rare and unusual circumstances in advance of the inspection due date and suggest allowing an extension request up to the tolerance date. Another commenter requested clarification as to when a request would need to be made.

FHWA Response: The exceptions to the inspection interval tolerance due to rare and unusual circumstances, such as a hurricane, which impact the ability of the owner to perform bridge inspections, have been revised to require that a request must be approved in advance of the inspection due date plus the tolerance. For example, for an inspection due on June 17, 2021, an exception request must be provided to FHWA with adequate time for review and approval before the end of the 3-month tolerance on September 30, 2021; accordingly, exception requests should be made as soon as a delay is known to be a possibility.

Section 650.313 Inspection Procedures

Section 650.313(a)

Seven commenters stated that the references in § 650.313 identify a version of the AASHTO Manual that is no longer current.

FHWA Response: FHWA agrees. New editions of the AASHTO Manual have been released since the development of the NPRM. This final rule adopts specific sections of the current version of the AASHTO Manual as stated in § 650.317.

References to specific sections of the AASHTO Manual throughout § 650.313 have been updated accordingly. The NBIS specifically references Section 1.4, Section 2.2, Section 4.2, Section 6, and Section 8.

Fifteen commenters had questions and concerns about inspection requirements for portions of a bridge that are not visible. Several commenters stated that in some situations, non-visual methods to inspect these portions are unnecessary, costly, or not proven to be reliable.

FHWA Response: FHWA acknowledges that portions of bridges are not visible during inspections; for example, buried foundations and reinforcing bars in concrete elements. It was not FHWA's intent in the NPRM to require the inspection of such elements as part of a routine inspection. The statement requiring non-visible portions to be assessed via another method has been removed from the final rule. The intent of this requirement is to ensure all areas of the bridge to be inspected are properly accessed as identified in the AASHTO Manual. The Bridge Inspector's Reference Manual (BIRM) and NHI training courses identify methods for accessing portions of the bridge to be inspected.

Eleven commenters did not support documenting equipment needs in an inspection plan for all bridges. The commenters questioned if a written inspection plan was required for all inspection types, especially routine inspections of common bridge types, *e.g.* reinforced concrete culvert.

FHWA Response: FHWA agrees that documenting equipment, while a good practice, does not need to be written in a plan or a procedure for all inspection types and has removed that statement from this section of the final rule. Inspection plans are not required for all types; however § 650.313(g), which addresses NSTM, underwater, in-depth, and complex feature inspection types does require documented inspection procedures for these inspection types.

Seven commenters sought clarification on whether advanced technologies such as UAS or structural monitoring, could be used in bridge inspection. One commenter

suggested FHWA continue to monitor technological advancements, evaluate their use in bridge inspection, and update policies which allow their use accordingly.

FHWA Response: FHWA encourages bridge owners to evaluate use of advanced technologies in bridge inspection. FHWA, through research and other programs, also evaluates advanced technologies and encourages their use where proven to be effective tools and methods for assessing bridge safety and condition. FHWA's position is that proven advanced technologies may be used to supplement but not supplant bridge inspection personnel and inspection methods. These technologies are not a replacement for personnel performing inspections nor are they intended to replace visual and physical methods. Advanced technologies may be useful when their use enables an inspection to be done more efficiently without compromising the thoroughness and effectiveness of the inspection or when visual and physical methods are not able to assess fully a bridge component.

UAS may be used by qualified personnel to supplement portions of a bridge inspection, but it cannot address all aspects of an inspection (i.e. live load response, auditory cues, sounding of members). For example, UAS cannot currently perform physical (tactile) examination such as sounding or hammering on the surface of a bridge member. This type of examination is needed because it establishes the soundness of the material and if present, the dimensions of the defect for tracking deterioration over time and for determining strength or capacity when calculating a load rating. Use of UAS may also be subject to practical considerations such as lighting, the need for cleaning the portion inspected, and the potential for driver distraction.

When used effectively to supplement a bridge inspection, the use of UAS has the potential to provide efficiencies for some inspections such as limiting the amount of time access equipment is used and reducing the time working adjacent to live traffic. UAS may be used to supplement a bridge inspection when its capabilities are able to meet the

requirements of a specific task in the bridge inspection. For example, a UAS may be an efficient tool for taking birds-eye view photography of a bridge site so that qualified personnel can observe and document changes in the channel since the last inspection. But even where UAS are used, if the photography shows concerning changes, the inspector must utilize physical (tactile) techniques to investigate further.

Technologies will continue to be developed that will change the way inspectors perform bridge inspection. FHWA will continue to evaluate these new tools in partnership with our stakeholders and update its bridge inspection guidance document, the BIRM, to allow these technological advancements to make their way into the National Bridge Inspection Program (NBIP).

Section 650.313(b)

Two commenters asked for clarification on what type of construction work constitutes “rehabilitation” as this triggers the need to perform an initial inspection.

FHWA Response: FHWA added the term “rehabilitation” and defines the term in § 650.305 of the final rule. Performing maintenance, repairs, or preservation work would not trigger a need to perform an initial inspection.

Two commenters questioned the need to perform an initial inspection on a rehabilitated bridge because the construction work was designed by a licensed engineer and overseen by qualified construction personnel.

FHWA Response: While many bridge construction projects are designed in accordance with State standards by licensed engineers and overseen by qualified construction personnel, not all work on bridges is designed to standards or administered by personnel meeting these professional qualifications. Further, the focus of design and construction personnel is different from that of personnel performing an NBIS safety inspection. Design and construction personnel strive to build a quality and durable bridge. The focus of personnel performing an initial inspection is to assure safety, update

inventory data, establish baseline conditions of the bridge, and to establish the timeline for all other types of inspections.

Thirty-three commenters had concern with completing an initial inspection prior to opening a bridge to traffic. These commenters cited several reasons including difficulty coordinating with construction contractors, a pressing need to open a bridge to alleviate traffic congestion, rigorous oversight during construction, minimal benefit, and costs associated with delaying an opening. One commenter supported completing an initial inspection prior to opening a bridge to traffic.

FHWA Response: FHWA acknowledges the concerns raised by many commenters that timing an inspection with the completion of a construction project can be challenging, could unnecessarily delay use of a new bridge by the public, and that many bridge construction projects are overseen by construction engineers and inspectors to ensure a quality bridge is properly built. For these reasons, FHWA has revised the requirement so that owners have 3 months from the date the bridge is opened to traffic to complete the initial inspection. However, FHWA continues to encourage owners to complete the initial inspection before the structure is open to traffic when possible, which allows for an inspection under more convenient circumstances for both the inspector and the travelling public.

Fourteen commenters had questions about the statement “[s]ubmit NBI data after the initial inspection of the entire bridge being open to traffic,” and whether this would require an additional submission above and beyond the annual data submission to the NBI that is required in other parts of the NBIS.

FHWA Response: FHWA does not require an additional data submission to the NBI for an initial inspection of a bridge. This statement has been removed from the final rule. FHWA requires that the data from the initial inspection be recorded in the State

DOT, Federal agency, or Tribal government's inventory as specified in § 650.315, and to be submitted to the NBI in the next annual data submission.

Twenty-eight commenters had concerns with performing initial and routine inspections on phased and temporary bridges. The commenters cited several reasons including difficulty coordinating with construction contractors, concerns with inspecting contractor owned temporary bridges, monitoring performed during construction by on-site personnel, and costs associated with performing these inspections, particularly if the project is accelerated and has many phases.

FHWA Response: Inspection of temporary bridges and bridges in phased construction that are open to public traffic is not a new requirement. See FHWA's Q&A 303-7 listed in 2011, at <https://www.fhwa.dot.gov/bridge/nbis/index.cfm> for clarification of the existing regulation. FHWA continues to require inspection of these types of bridges. The statements in the NPRM were to clarify this requirement as FHWA has received many questions about these types of bridges over the years. Questions have been asked about how specific sections of the NBIS would apply to various situations. Given the seamless nature of the Nation's highway system and the public's expectation for a uniform level of safety and reliability, it is FHWA's position that when these bridges are open to public traffic, they are to follow the requirements of the NBIS to ensure public safety.

Regarding inspection of contractor-owned bridges and monitoring during construction, many factors influence the in-service performance of contractor-owned bridges and the thoroughness of monitoring that occurs during a construction project. To ensure a uniform level of safety and reliability when they are carrying public traffic, these bridges must be inspected to the requirements of the NBIS.

In the final rule, FHWA removed the specific language for these types of bridges in the initial and routine inspection types in § 650.313 and added language in § 650.303

‘Applicability’ to clarify that these types of bridges are subject to all requirements of the NBIS. The first requirement is to complete the initial inspection, which is due within 3 months of being opened to public traffic. The timeline for all other applicable inspection types are established from this inspection.

If a temporary bridge is opened to traffic, then subsequently removed or permanently closed to public traffic less than 3 months later, it would not be subject to the NBIS. If a bridge is being built in phases, the initial inspection is required within 3 months of the first phase that opens all or a portion of the bridge to traffic. On projects with many phases or rapid progression through phases (*e.g.* nightly or weekend closures), it is possible for up to 3 months of construction work to occur and multiple phases to have elapsed before the initial inspection is due. FHWA understands the possible challenges with performing initial and routine inspections on phased and temporary bridges; however, inspection of these bridges that are open to public traffic is not a new requirement and FHWA retains this requirement in the final rule.

Six commenters had questions about what constitutes a phase of construction.

FHWA Response: Phased construction is intended to address bridges which are partially built in stages with portions opened to traffic until the final full cross section is completed and all lanes are opened to traffic.

Section 650.313(c)

Eighteen commenters had questions about the scope of a routine inspection. These commenters also had questions about two statements in this section, specifically “any portion[s] of the bridge not visible using standard access methods...” and “an area of the structure requires a closer, more detailed inspection...”. Commenters demonstrated wide interpretation of inspection requirements that could result from these statements.

FHWA Response: FHWA has removed these statements from the final rule. A routine inspection is defined in § 650.305, and a specific reference to AASHTO Manual Section 4.2 has replaced the removed statements to point the reader to specific material that explains what is required to perform a routine inspection. Additional information is available in the BIRM and NHI training courses to explain access techniques and inspection methods utilized on a routine inspection that when utilized, satisfy the requirements of this regulation.

Three commenters had questions about submitting NBI data for temporary bridges and whether this would require an additional submission above and beyond the annual data submission to the NBI that is required in other parts of the NBIS. The commenters also raised concerns with creating and removing records in the inventory for bridges that are only in service for a short period of time.

FHWA Response: FHWA does not require additional data submissions to the NBI for a temporary bridge. This statement has been removed from the final rule. In response to concerns with adding and removing data for temporary bridges in a State DOT, Federal agency, or Tribal government's inventory, FHWA has added in § 650.315 a provision which gives these entities the option not to submit inspection data for a temporary bridge as part of the annual data submission to the NBI until it has been open to traffic for 24 months. This is to provide some relief to owners in adding and removing bridges from their inventory, and preparing and submitting data to the NBI for those bridges which are truly temporary and only in service for a short period of time.

Section 650.313(e)

Twenty-five commenters had concern with completing an underwater inspection within 6 months of opening a bridge to traffic. Commenters cited several reasons including climatic factors such as winter weather, timing of seasonal high-water, rigorous oversight during construction, and availability of specialized inspectors, *e.g.* divers. Two

commenters expressed support for completing an inspection within 6 months of opening a bridge to traffic.

FHWA Response: FHWA acknowledges owners need some discretion in scheduling this type of inspection due to the timing of when a bridge opens to traffic, use of specialized personnel and equipment, and climactic or environmental restrictions. However, it is the position of FHWA that an underwater inspection occur soon after the bridge is open to traffic to ensure the safety of the travelling public and establish a baseline for future inspections. FHWA has modified the proposed requirement in the NPRM for completing the first underwater inspection within 6 months, to completing it within 12 months after a bridge is opened to traffic. This allows a bridge owner a full seasonal cycle to perform the first underwater inspection because of the issues identified.

Eight commenters questioned the need to perform an underwater inspection on a rehabilitated bridge when the scope of rehabilitation work did not affect the underwater portions of the bridge.

FHWA Response: FHWA agrees with the commenters and has modified the NBIS to clarify that a rehabilitated bridge only needs an underwater inspection within 12 months if work was performed on portions of the bridge that are underwater. Any underwater portions that were not rehabilitated do not need an underwater inspection within 12 months and can remain on their current underwater inspection interval. For bridges being rehabilitated in phases, those portions must receive an underwater inspection within 12 months of the phase opening to traffic or the phase being completed if the bridge was never closed to traffic during the rehabilitation work.

Two commenters requested FHWA approval to use underwater imaging technology such as sonar on underwater inspections.

FHWA Response: The use of underwater imaging technology for performing an underwater inspection is not excluded in the current NBIS or this final rule. Also, the

AASHTO Manual Section 4.2, which is incorporated by reference, requires diving or ‘other appropriate techniques’ to complete an underwater inspection. FHWA recognizes there may be instances in which an underwater inspection cannot be safely performed using traditional diving methods. The program manager must identify and document all requirements for performing underwater imaging for underwater inspection.

Section 650.313(f)

Nine commenters had concern with completing an NSTM inspection within 6 months of opening a bridge to traffic. Commenters cited several reasons including climatic factors such as winter weather, rigorous oversight during construction, and availability of specialized NSTM inspectors. Two commenters expressed support for completing an inspection within 6 months of opening a bridge to traffic.

FHWA Response: Similar to requirements for an underwater inspection, FHWA acknowledges owners need some discretion in scheduling this type of inspection due to the timing of when a bridge opens to traffic, use of specialized personnel and equipment, seasonal constraints, and other restrictions. However, FHWA believes it is important for the safety of the travelling public that an NSTM inspection occur relatively soon after it is opened to traffic to understand the overall condition of the bridge and to develop a baseline for the future inspections. Therefore, FHWA has modified the proposed requirement in the NPRM for completing the first NSTM inspection within 6 months, to completing it within 12 months after a bridge is opened to traffic. This allows a bridge owner a full seasonal cycle to optimize the timing of the first NSTM inspection.

Four commenters questioned the need to perform an NSTM inspection on a rehabilitated bridge when the scope of rehabilitation work did not affect NSTM members on the bridge.

FHWA Response: Similar to the requirements for an underwater inspection, FHWA agrees with the commenters and has modified the NBIS to clarify that a

rehabilitated bridge only needs an NSTM inspection within 12 months if the work was performed on a NSTM. Any NSTMs that were not rehabilitated do not need an NSTM inspection within 12 months and can remain on their current NSTM inspection interval. For bridges with NSTMs being rehabilitated in phases, the rehabilitated NSTMs must receive an NSTM inspection within 12 months of the phase opening to traffic or the phase being completed if the bridge was never closed to traffic during the rehabilitation work.

Eight commenters listed several types of redundancy and questioned which ones required demonstration of redundancy through an FHWA approved process. Three commenters asked for information explaining what is required for an FHWA approved process.

FHWA Response: A provision has been added in § 650.313(f) of the final rule which allows for a State DOT, Federal agency, or Tribal government to demonstrate to FHWA that a member has system or internal redundancy through the use of nationally recognized methods. The AASHTO Guide Specifications for Internal Redundancy of Mechanically-Fastened Built-Up Steel Members¹² and AASHTO Guide Specifications for Analysis and Identification of Fracture Critical Members and System Redundant Members¹³ are examples of nationally recognized methods. FHWA has added criteria to the regulation on what should be submitted by a State DOT, Federal agency, or Tribal government, such as design and construction details, and we will review the policies and procedures for approval based upon conformance with the nationally recognized

¹² The AASHTO Guide Specifications for Internal Redundancy of Mechanically-Fastened Built-Up Steel Members, 1st Edition may be found at the following URL:
<https://store.transportation.org/Item/PublicationDetail?ID=4149>.

¹³ AASHTO Guide Specifications for Analysis and Identification of Fracture Critical Members and System Redundant Members, 1st Edition may be found at the following URL:
<https://store.transportation.org/Item/PublicationDetail?ID=4149>¹.

methods. If the owner demonstrates either system or internal redundancy, a hands-on, NSTM inspection of the member is not required. The bridge would still be subject to all other inspection types as applicable.

Section 650.313(g)

Four commenters requested clarification for what traditional inspection methods are, and how FHWA would grant approval of exceptions.

FHWA Response: Inspection methods are explained in the AASHTO Manual, the BIRM, and training courses. FHWA does not intend to approve exceptions to traditional inspection methods and has removed this statement in the final rule. If an owner proposes to use methods that are not described in these sources, such as an emerging technology, the owner should perform the inspection with proven methods and may also utilize the emerging technology to supplement the inspection or to compare results.

Section 650.313(h)

Twelve commenters requested that a special inspection of a bridge be allowed which focuses on the areas of deterioration or damage in lieu of routine and underwater inspections when the routine and underwater inspection intervals as described in § 650.311 are reduced below 24 months and 60 months, respectively.

FHWA Response: The intent of reducing an inspection interval is to increase monitoring and scrutiny in areas that are deteriorating, damaged, or otherwise of concern. When the routine and underwater inspection intervals are reduced below 24 and 60 months respectively, FHWA agrees a special inspection may be performed in lieu of a routine or underwater inspection of the full bridge. Provisions were added to §§ 650.311 and 650.313 allowing this option for bridge owners. When this option is invoked, routine and underwater inspections of the full bridge are still required at least every 24 and 60 months, respectively. For this type of inspection, the NBIS requires a qualified team leader and documented inspection procedures which identify the area(s) to be inspected,

methods to be used, and other pertinent information necessary to ensure an adequate special inspection is performed. Special inspections are to be focused in the area(s) of concern on the bridge that are causing the inspection interval(s) to be reduced.

Section 650.313(i)

Six commenters stated the requirements of a service inspection are unclear and requested that service inspection requirements be clarified.

FHWA Response: FHWA has clarified the purpose of a service inspection and personnel that would perform these inspections in the discussion for § 650.305, Definitions. FHWA utilized NCHRP Report 782 – Proposed Guideline for Reliability-Based Bridge Inspection Practices¹⁴ in the development of this inspection type. FHWA has added a paragraph to § 650.313 to explain that all bridges with a routine inspection interval greater than 48 months require a service inspection and that inspection results, including the date of inspection and any required follow-up actions, are to be documented in the bridge file when this inspection type is performed.

Section 650.313(j)

One commenter suggested a team leader be required to perform special inspections.

FHWA Response: The purpose of a special inspection is to monitor a known or suspected deficiency, or to monitor special details or unusual characteristics of bridges that do not necessarily have defects. As a result, the scope of special inspections can vary widely between owners and bridges. Many of the parameters for performing a special inspection are to be defined by the owner and documented in special inspection procedures. The NBIS only requires a qualified team leader for a special inspection as

¹⁴ The NCHRP Report 782 may be found at the following URL:
<http://www.trb.org/Publications/Blurbs/171448.aspx>.

described in § 650.313(h) and (j). Since there are a number of reasons why special inspections are performed, FHWA is not requiring that a Team Leader perform all special inspections. There may be situations where it is not necessary for a Team Leader to lead the inspection, but this must be documented in the special inspection procedures.

Section 650.313(k)

Twenty-one commenters stated 3 months is not enough time to load rate some bridges or address changes which affect large portions of a bridge inventory. Two commenters expressed support for a 3-month timeframe to load rate bridges.

FHWA Response: Timely completion of load ratings is important to understand the live load carrying limits of a bridge and maintain the safety of the traveling public. Therefore, FHWA maintains the requirement to complete load ratings within 3 months from the time the need for a load rating is identified. This requirement is aligned with the NTIS. In the rare and unusual circumstance that certain bridges, such as those with especially complex features, may require more than 3 months to complete a load rating, bridge owners should contact FHWA staff promptly.

When a large portion of the inventory requires load rating because of changes in Federal law or regulation, FHWA will continue to work with the States to address these situations through appropriate methods. We note that FHWA and States faced a similar challenge with respect to accommodating load ratings for emergency vehicles after those vehicles were made legal loads in the Fixing America's Surface Transportation Act.

When a large portion of a State's inventory requires load rating because of changes in State law or regulation, FHWA will work with the State to develop a plan to address this issue.

Six commenters had questions about when a bridge needs to be re-rated for loads. Commenters also requested that owners have discretion to set criteria for when a bridge needs to be re-rated and the priority for completing the load rating.

FHWA Response: FHWA agrees and has clarified in the final rule when a bridge should be re-rated. Change in condition of a structural element, change in dead load, change in live load, or completion of construction, reconstruction, or rehabilitation are the most common reasons a bridge needs to be re-rated. These are typically found during an inspection, and as a result, the need to re-rate a bridge is often in response to an inspection finding. However, there are other reasons a bridge may need to be re-rated, such as new legal vehicles introduced or damage resulting from an unexpected event. The AASHTO Manual and the BIRM provide additional information. Bridge owners have discretion to set criteria and priorities for re-rating bridges which are more stringent than the NBIS.

Ten commenters questioned why a bridge needs to be load rated for a permit load. Commenters also stated they have tools and processes developed that enable them to efficiently process permit requests they routinely receive.

FHWA Response: Because permit loads utilize public roads, verification that bridges can carry the load is required to ensure the safety of the travelling public and hauler; as such, FHWA has retained the requirement to analyze permit loads in the final rule. FHWA recognizes some owners have developed screening tools and other processes for analyzing permit loads for which they routinely receive permit requests. These tools and processes are acceptable methods of analyzing permit loads, provided they are founded upon actual modeling and analysis of bridge responses under permit vehicles and loads that envelope the hauling vehicle and load that is requesting a load permit.

Section 650.313(l)

Fifteen commenters expressed concerns about posting for routine permit loads. Commenters cited driver confusion, costs, and infeasibility of installing posting signs at

bridges for a potentially infinite number of permit vehicles. Commenters stated their permitting processes address whether a permit load can cross a bridge.

FHWA Response: For unrestricted legal loads, load posting is a public safety issue. Bridges must be posted informing the travelling public of the maximum load that bridges can safely carry. However, for routine permitted vehicles that do not fall within the general posted weight limit, and where load posting for these vehicles is not feasible, the FHWA has historically said that the permit process is an acceptable means for bridge owners to verify that bridges on designated routes can safely carry the permitted vehicles. Permit vehicles are restricted from travelling off of designated routes. Because of this, FHWA agrees that load posting of bridges for routine permit vehicles is not required. The final rule has been revised to clarify that restriction is acceptable in lieu of posting bridges for permit vehicles. This is consistent with previous NBIS regulations.

Thirty-six commenters expressed concerns about the feasibility of load posting bridges in 30 days or less. Commenters cited several reasons including the time needed to fabricate signs, lengthy processes required in some State or local laws, postings of varying urgency, and weather and site restrictions.

FHWA Response: Load posting informs the travelling public of the maximum load that bridges can safely carry. As discussed above, for unrestricted legal loads, lack of load posting signs is a public safety issue, which some bridge owners consider to be a critical finding requiring immediate follow-up action. Due to the safety issue and other factors, owners must establish procedures that prioritize installation of load posting signs based upon the associated risks and need. In some situations, the urgency to implement a load posting is much less than 30 days. FHWA acknowledges that posting within 30 days or less in very urgent situations may require some bridge owners to change their business practices. The NBIS establishes requirements for timely installation of load posting signs that align with the load posting requirements in the NTIS.

Section 650.313(m)

Six commenters expressed concerns with developing criteria for closing a bridge. Commenters stated that closing a bridge is often dependent upon parameters that are specific and unique to a specific bridge and therefore it is difficult to develop standard criteria.

FHWA Response: Similar to the general procedures described in § 650.313(g), FHWA is requiring general procedures for closing bridges be documented. General procedures are applicable to many bridges and describe criteria for when a bridge must be closed and the process which describes the steps and timelines for closing a bridge. FHWA acknowledges that all factors requiring bridge closure cannot be anticipated; therefore, these procedures are expected to be general in nature and should be applicable to many bridges.

Two commenters expressed concern that a 3-ton gross live load is too low for bridge closure. Commenters stated that many vehicles in the general non-commercial vehicle fleet are heavier than 3 tons and preferred a closure weight of 4-5 tons.

FHWA Response: FHWA acknowledges there are some vehicles in the general passenger vehicle fleet, and many commercial trucks, that have an empty vehicle weight of more than 3 tons. FHWA has set 3 tons as the absolute minimum gross live load capacity as this is consistent with the AASHTO Manual. FHWA encourages owners to adopt more stringent closure criteria. This may include requiring closure at higher gross live load weights than 3 tons.

Section 650.313(n)

Based on seven comments previously discussed in § 650.313(a) which desired incorporation of a more current version of AASHTO Manual into the NBIS, FHWA has revised the section reference for bridge files to AASHTO Manual Section 2.2.

FHWA has only adopted Section 2.2 of Chapter 2 of the AASHTO Manual to describe components of a bridge file. This more exact reference points the reader to the specific components listed in Chapter 2 of the AASHTO Manual that are required to be in a bridge file. Other portions of Chapter 2 describe other excellent components that may be useful to an owner and could be contained in a bridge file. FHWA encourages maintaining these in the bridge files as well; however, those outside of Section 2.2 are not required as part of the NBIS.

Section 650.313(o)

Three commenters requested FHWA explain the “scour appraisal” process. One commenter requested FHWA explain the “scour evaluation” process. One commenter requested FHWA explain the “scour assessment” process. Five commenters asked if these processes are to be performed in accordance with HECs.

FHWA Response: Based on the comments in this section and § 650.305, the definitions related to the identified scour processes and this section have been revised to provide clarity of the requirements of the NBIS. FHWA recognizes that HECs 18, 20, and 23 are the state of practice for the appraisal, design, and inspection of bridge scour, stream stability, and scour countermeasures. As stated in the final rule, the scour appraisal and scour evaluation processes should be consistent with HEC 18 and 20. The scour assessment process should be consistent with HEC 20. The development of a scour POA for a bridge should be consistent with HEC 18 and 23.

Five commenters requested clarification for how scour appraisal, scour evaluation, and the scour assessment processes work together.

FHWA Response: This section and the scour related definitions have been updated to clarify scour appraisal is the overarching process that includes three methods for determining the worst case scour at a bridge; observed scour, scour evaluations, or scour assessments. The bridge owner must perform a scour appraisal for each bridge

over water to determine if the bridge is scour-critical and whether it requires a scour POA. The scour appraisal determination for a bridge is to be based upon the least stable of observed scour, evaluated scour, or assessed scour.

Eight commenters requested clarification for when scour POAs are needed for bridges over water. Several commenters specifically questioned whether a bridge with an unknown foundation requires a scour POA.

FHWA Response: All bridges that are scour critical or have unknown foundations require a scour POA. The existing NBIS regulations state that owners must develop a scour POA for each bridge that is scour critical. There are several guidance documents and reference manuals available on FHWA's Hydraulic Engineering webpage that address these requirements and provides guidance for developing a scour POA.

If a bridge has unknown foundations, no scour appraisal can fully determine vulnerability to scour; therefore, such a bridge requires a scour POA to manage scour risks associated with that bridge. The FHWA memo, "Additional Guidance for Assessment of Bridges Over Waterways with Unknown Foundations," dated October 29, 2009,¹⁵ as well as other guidance documents and reference manuals, provide information for developing a scour POA specifically for a bridge with an unknown foundation type.

Ten commenters requested FHWA clarify that a scour POA can be based solely upon monitoring and does not need to describe installation of physical or hydraulic countermeasures.

FHWA Response: FHWA agrees that for certain bridges, a scour POA may be based on a monitoring program to manage the risks associated with scour. As HEC 18 and 23 and other guidance documents explain, bridges with the greatest risk from scour-

¹⁵ Additional Guidance for Assessment of Bridges Over Waterways with Unknown Foundations may be found at the following URL: <https://www.fhwa.dot.gov/unknownfoundations/091029.cfm>.

induced failure should have a scour POA that describes installation of physical or hydraulic countermeasures, or even replacement, and also include a monitoring program that allows time to implement these physical or hydraulic countermeasures. Bridges that present a lesser risk may be considered candidates for a scour POA based solely on a monitoring program as an acceptable countermeasure.

Two commenters asked if existing scour evaluations completed prior to this regulation need to be redone.

FHWA Response: The final rule only requires existing scour evaluations or scour assessments to be updated when the assumptions, bridge conditions, channel conditions, or other pertinent factors used in the existing scour evaluation or scour assessment are no longer representative of current conditions or are determined to be invalid.

Section 650.313(p)

Two commenters had questions about whether quality control (QC) and quality assurance (QA) must be performed by independent personnel. Commenters were concerned that additional qualified personnel would be required to observe inspection teams at a bridge site, effectively doubling personnel needs.

FHWA Response: As described in AASHTO Manual Section 1.4, which is incorporated by reference in § 650.317 of this final rule, QC and QA reviews are to be performed by a person other than the originating person(s). However, the specific parameters of a QC and QA program, including the extent and interval for observing inspection teams to ensure quality are defined by the program manager. The NBIS language has been updated to emphasize this. While this has been clarified, the basic requirements are in the existing regulation, so there should be no additional personnel needs.

Section 650.313(q)

General

The critical findings section received over 125 comments and FHWA has incorporated many of the suggested changes made by commenters. Specific changes are described in greater detail below following an overview of the general changes to this section.

The definition for “critical finding” does not substantially change from the existing regulation; however, State DOTs, Federal agencies, and Tribal governments are required to identify what they consider a critical finding based upon the minimum requirements in § 650.313(q) of the final rule. Paragraph (q) contains only the minimum requirements; FHWA encourages bridge owners to adopt more stringent criteria as appropriate that align with the characteristics of their organization and the issues they experience in their bridge inventory.

The reporting process for notifying FHWA of critical findings and corrective actions taken in response to critical findings is updated in the final rule. State DOTs are to report critical findings information to their respective FHWA Division office. Similarly, Federal agencies and Tribal governments are to report required information to the FHWA FLH office. FHWA’s goal is safety and national consistency. Federal agencies and Tribal governments are to follow the same procedures as those required for State DOTs.

Section 650.313(q)(1)(i) lists several deficiencies that result in a critical finding. This section also identifies that any condition posing an imminent threat to public safety is a critical finding. Owners are required to develop procedures that identify critical findings based upon their inventory. Critical findings procedures have two main objectives: first, the procedures must clearly establish criteria for those deficiencies which are critical findings and require immediate action to preserve public safety; and second, the procedures must describe a process to resolve immediately the critical finding.

Four commenters expressed concern with the duplication of “full or partial closure of a bridge” and a “recommendation for a full or partial closure of a bridge by the program manager” as critical findings.

FHWA Response: FHWA agrees and has removed the duplicative criteria of a program manager recommending closure.

Twenty-one commenters expressed concern with the minimum critical finding criteria for Superstructure Condition and Substructure Condition ratings of serious (3) as too conservative. The commenters also felt that over time, such conservative criteria could desensitize staff to the significance and urgency of critical findings. The commenters stated this would significantly increase the number of critical findings and would require significant additional resources to follow-up on issues that, while serious, may not be critical.

FHWA Response: FHWA agrees with the commenters. The threshold has been revised from serious (3) to critical (2) as defined in the 0-9 scale for condition ratings in the SNBI. FHWA has added Channel Condition and Scour Condition ratings of critical (2) or worse as defined in the SNBI to the minimum criteria defining critical findings. This is consistent with other deficiencies described in the general description of critical findings. FHWA has also included the Deck Condition and Culvert Condition ratings, as it is our position that critical findings on these components pose a threat to public safety.

Twenty-seven commenters expressed concern with the minimum criteria for a nonredundant member with any quantity in Condition State 4 (CS4). Commenters cited several reasons why implementing this criteria could be problematic, including that element level data is not required and therefore not available on all bridges (non-NHS bridges); element data is typically used for bridge management purposes, not safety inspection; the sometimes temporary nature of an element being in CS4; the inclusion of

non-critical conditions included in the CS4 definition; and questions concerning how a nonredundant member is defined.

FHWA Response: FHWA has changed this criteria in the final rule by removing the nonredundant term and adding the NSTM to the critical findings section. This change requires owners to consider redundancy or lack of redundancy in steel tension members as part of the general criteria for a critical finding.

Twenty-seven commenters expressed concern with missing load posting signage as critical findings criteria. The primary concern was with the amount of resources that would be needed to report on these issues as they work to resolve them.

FHWA Response: Missing or illegible signs are a public safety issue, and must be replaced according to the owner's posting procedure. FHWA acknowledges that owners have a wide range of processes for addressing missing or damaged load posting signage. We have moved this criteria from the critical findings process to load posting in § 650.313(l)(3) of the final rule. Consistent with our 2019 policy memorandum and to align with the NTIS, a 30-day maximum timeframe, from when the need is identified, to replace missing or damaged load posting signs is in the final rule.

Thirteen commenters asked whether a critical finding occurs if immediate restrictions, postings, repairs, or other follow-up actions are performed and the deficiency is immediately resolved.

FHWA Response: Whenever there is an imminent threat to public safety that demands an immediate response, the deficiency is considered a critical finding regardless of whether it was resolved immediately upon discovery or not. These deficiencies are to be reported as required in the NBIS.

Two commenters asked whether planned versus unplanned closures and restrictions result in a critical finding.

FHWA Response: The final rule requires that when deficiencies are found that result in a full or partial closure, this is to be identified as a Critical Finding. It is not possible to address every possible situation; however, generally planned closures and restrictions are not critical findings and unplanned closures and restrictions are critical findings. For example, a planned bridge closing because of a construction project starting is usually not a critical finding. However, if that same bridge was open to traffic during a construction project and was unexpectedly closed or restricted because of a newly discovered deficiency, that would be a critical finding and should be reported as such.

Eighteen commenters expressed concern with reporting critical findings to FHWA within 24 hours of discovery. They stressed that during the first 24 hours, an owner is urgently focused on resolving the critical finding and that reporting is not the highest priority.

FHWA Response: A similar requirement for notifying FHWA within 24 hours is in the NTIS. Consistent with the NTIS, the regulation does not require a formal report or a developed resolution, but only simple notification of the local FHWA Division Office. FHWA believes this can easily be accomplished through a telephone conversation or an email message. Due to the critical nature of these conditions, FHWA does not believe that these requirements are excessive. The intent of these requirements is to create a reporting mechanism to FHWA of the critical items that could be a threat to the traveling public's safety. Further, this specific portion of the final rule seeks to ensure that severe conditions are addressed in a timely and appropriate manner through oversight and partnership with FHWA, which was specifically required in MAP-21.

Twenty-one commenters asked for clarification on what is meant by reporting until the critical finding is "permanently resolved."

FHWA Response: FHWA revised the final rule to require reporting until “resolved” to align with the NTIS. Similar to the NTIS, FHWA expects bridge owners to report and provide updates on each critical finding until it is resolved. Resolved means an action has been taken and completed to mitigate the deficiencies and protect public safety. This could involve lane or load restriction, shoring, repair, closure, or replacement of the bridge. Increased inspection frequency alone does not fully resolve a critical finding if the underlying safety issue is not rectified. A critical finding is to be reported monthly until the threat to public safety is no longer present.

Four commenters requested clarification on whether all critical findings are to be reported monthly, or if reporting is only intended for new critical findings that have occurred since the previous report.

FHWA Response: FHWA requires all critical findings be reported monthly, or as requested, until each critical finding is resolved. It is expected that critical findings be resolved as soon as possible, typically in less than 30 days, which would mean most critical findings are reported on for only the initial month and possibly a second month, depending upon the dates when the critical finding occurs and is resolved within a monthly reporting interval.

Section 650.315 Inventory

Ten commenters indicated the reduction from 180 days to 3 months for local bridge data submission of revised data is too constrictive and local agencies may not be able to meet the time constraint. One local agency commenter indicated they already submit data within 3 months.

FHWA Response: FHWA believes that with current technological capabilities, the requirement of 3 months for reporting bridge inspection data to be recorded in the State, Federal agency, or Tribal government database is reasonable. FHWA only collects this data once a year and any delay in the data being properly inventoried would not

provide FHWA the most current data available. Up-to-date information is vital to program oversight, management, and stewardship for the State and FHWA. It is also important that FHWA have current data because this data is used to: (1) track bridge performance measures, (2) provide reports to Congress, and (3) make critical decisions regarding the bridge program. This necessitates adherence to a firm 3-month collection period and is also consistent with the NTIS.

Three commenters indicated opposition to collecting element level data for non-NHS bridges. One commenter supported the collection of element level data to provide bridge owners improved planning and decisionmaking data. One commenter wanted clarification of when element level data is required to be collected.

FHWA Response: As required by Congress in 23 U.S.C. 144(d)(2), each State and Federal agency shall report element level data for all highway bridges on the NHS. Section 650.315(a) of this final rule supports this requirement. The NBIS does not require States to submit element level data for bridges off the NHS. However, FHWA and its NBI will accept element level data for bridges off the NHS if a State DOT chooses to submit it. As identified in § 650.315(c), element level data is to be updated for all inspection types if there is a change in condition.

Section 650.317 Incorporation by Reference

The AASHTO recommended the contact information for AASHTO publications be updated.

FHWA Response: The contact information has been updated.

The AASHTO commented that they understand FHWA must reference a specific edition of the Manual for Bridge Evaluation and Manual for Bridge Element Inspection and that the regulation cannot simply say “most current edition.” Since both publications are updated more frequently than the NBIS, it forces States to use outdated guidance. Since 23 CFR 625.4 contains a list of other standards, policies, and specifications and is

subject to more frequent updates, AASHTO recommends adding these two publications to the next update of 23 CFR 625.4, and including in this section language referencing these specific editions or the most current ones as shown in 23 CFR 625.4.

FHWA Response: FHWA acknowledges the procedural challenges with updating material incorporated by reference. FHWA follows the regulations and procedures of the Office of the Federal Register for this process. The documents incorporated by reference represent the minimum standards required for compliance with the NBIS. As in the past, when a new edition of an incorporated by reference document is available, FHWA has recognized through policy memo where changes in the new edition exceed the minimum standards and can be used while maintaining compliance with NBIS.

Four commenters commented that the 3rd edition of the AASHTO Manual be incorporated into the NBIS. Fourteen commenters suggested referencing the latest edition, and not stating a specific edition.

FHWA Response: FHWA agrees and has adopted specific sections of the current 3rd edition version of the AASHTO Manual available at the time the final rule is published. References to specific sections of the AASHTO Manual throughout NBIS have been updated accordingly. The NBIS specifically references Section 1.4, Section 2.2, Section 4.2, Section 6, and Section 8, excluding the 3rd paragraph in Article 6B.7.1. This paragraph was excluded because FHWA is not aware of any research that served as the basis for the practice described in this paragraph and as such does not align with the requirements of the NBIS. Office of the Federal Register regulations at 1 CFR 51.1(f) provide that incorporation by reference of a publication is limited to the edition of the publication that is approved and that future amendments or revisions of the publication are not included. A specific edition of the manual must be referenced in the regulation. This provides certainty to the users of the regulation which standards apply, in addition to insuring for notice and comment as required by the Administrative Procedure Act.

Where differences exist, the NBIS takes precedence over the AASHTO Manual. The FHWA will continue to update, as necessary, the materials incorporated by reference in its regulations on a regular basis.

Specifications for the National Bridge Inventory

With the publication of the final rule, the SNBI will supersede the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges (Coding Guide), 1995. The final SNBI document in portable document format (PDF) is available for download on the docket for this rulemaking and as noted in § 650.317.

Bridge inventory information collected by each State DOT, Federal agency and Tribal government is reported to FHWA, as requested, in accordance with the NBIS reporting requirements. The resulting information is maintained in the National Bridge Inventory (NBI) database. The reporting of inventory data for all highway bridges subject to the NBIS, and their related features, are based on the definitions, explanations, and data items supplied in the SNBI. State DOTs, Federal agencies, and Tribal governments use the data items and instructions in the SNBI when reporting NBI data to FHWA.

General

One commenter proposed that the SNBI document provide for scheduled revisions, similar to the AASHTO manuals.

FHWA Response: The processes that FHWA must follow for updating a document incorporated by reference are discussed above and are different from AASHTO's. FHWA will continue to work through established processes when updates are needed. Updates are completed through the rulemaking process.

Many commenters indicated concerns with the number of added items in the proposed SNBI, and questioned their purpose and value.

FHWA Response: The items in the SNBI serve the following practical purposes and benefits: ensuring highway bridge safety; enabling oversight of the NBIP; reporting to Congress; emergency response; administering a risk-based, data driven, performance management program in accordance with MAP-21, the FAST Act, and 23 CFR part 490; and providing quality data through clarity and ease of use.

Element level data for NHS bridges, as required by 23 U.S.C. 144, have been reported to FHWA since April 2015 and are not considered new data for this rule; the 2014 Specification for the National Bridge Inventory – Bridge Elements (SNBIBE) has been merged with the SNBI. Fifty-seven of the 154 data items in the SNBI are considered new with respect to the Coding Guide and SNBIBE; 4 of these are calculated by FHWA and States are not required to be collected or reported to FHWA. Thirty-five of the 57 items are collected at a frequency indicated as “I” (Initial), where data is recorded initially and updated when necessary, but will not typically change from inspection to inspection. Only fifteen of the 57 new items are collected at a frequency indicated as “EI” (Each Inspection), where data is verified and/or updated by the inspector during each inspection. Items that are no longer used by FHWA have been removed.

Sixteen commenters indicated concerns with the number of item code changes proposed for those data items that have been brought forward from the Coding Guide into the SNBI. Three State DOTs suggested that there might be confusion when comparing data items between the two specifications, and expressed concern over the resources that will be required to populate and submit the SNBI data. One commenter requested that when the final rule is published, FHWA at that time also publish the new data submission format and details, as well as the updated processing logic for agencies. Agencies will need this information to update their software to support the SNBI data. Six commenters indicated a need for a migration process.

FHWA Response: FHWA recognizes that the transition from the Coding Guide to the SNBI will be a significant effort, and aims to reduce the burden on bridge owners. Many SNBI data items are identical to those in the Coding Guide, and coding options have been revised where practical to align more closely with codes in the Coding Guide, thereby facilitating the transition to the SNBI. FHWA will provide a crosswalk in the coming months that defines the relationship between the Coding Guide and the SNBI. The anticipated data submission format and data checking protocols will also be provided. In addition, FHWA will develop a computer-based tool to transition data from the Coding Guide format to the SNBI format, where the data can be accurately transitioned; this tool should be available at FHWA's website for use within 12 months of the effective date of the final rule.

Twenty commenters were concerned about the timeframe for implementation of the SNBI due to the need for updating databases, migrating existing data, training personnel, and collecting and reporting the required data. These commenters recommended implementation timeframes between 24 to 48 months before the first data submission, with full implementation taking up to 10 years, given extended inspection frequencies.

FHWA Response: An implementation timeline is under development with an expectation of collecting initial SNBI data in the March 2026 data submittal. Based on analysis, this will allow sufficient time for FHWA and State DOTs to develop, test, install, and set up new data collection and management systems. The initial dataset will largely consist of transitioned data (data that can be accurately converted from the Coding Guide format to the SNBI format), as well as those limited data items that do not transition accurately, but are required for administering FHWA programs. The remaining items that do not transition accurately may be populated, and the transitioned items may be verified, during the following inspection cycle, with the expectation that all data for all

bridges be populated and verified by the March 2028 data submittal. FHWA considers this timeline to be fair and achievable based on FHWA developing and providing tools for data transition, training, and data reporting format, and the need to collect specific data required by the final rule for extended inspection intervals.

One State DOT requested a data dictionary for the SNBI.

FHWA Response: The SNBI document provides information for a data dictionary, specifically Figure 1 and the tables in Appendix B.

Several commenters questioned whether event-related data items (*i.e.* Work Performed) will require reporting of events that occurred prior to implementation of the SNBI.

FHWA Response: FHWA will not require the reporting of event-related data that occurred prior to implementation of the SNBI.

Some commenters requested the inclusion of additional illustrations to communicate how item values are to be determined.

FHWA Response: Multiple illustrations were added or revised where clarification was needed based on comments received and FHWA internal reviews. Language was also revised to address situations where the intent may not be conveyed sufficiently by the included language or illustrations.

Cost

In response to the request by FHWA, eleven State DOTs provided data for costs associated with the proposed change from the Coding Guide to the SNBI. The reported costs ranged from approximately \$200,000 to \$18,000,000.

FHWA Response: FHWA recognized that bridge owners would incur a one-time cost associated with changing from the Coding Guide to the SNBI. However, as many of the data items are the same or similar, and there is a wide variety of data management and reporting systems being used, FHWA was unable to estimate these costs. The cost

information received from the commenters was used to update the Regulatory Impact Analysis (RIA), available in the docket for this rulemaking.

Discontinued Items

One commenter indicated that the discontinued *Parallel Structure Designation* item (Item 101) in the Coding Guide was useful for designating twin bridges.

FHWA Response: The *Parallel Structure Designation* item has been discontinued, as it is no longer needed by FHWA. Bridge owners can continue to collect the data for their use, but will not report the data to FHWA.

New Items Proposed

One commenter proposed an *Approach Roadway Surface* item that distinguishes between roadway surface types that impact bridge management or bridge design. For example, preservation actions for a bridge can be completely different due to the deicing treatments that are used on paved roads, but not gravel. Concrete roads require consideration for roadway expansion effects on bridge approaches.

FHWA Response: FHWA appreciates this suggestion but does not require these data to fulfill its stewardship and oversight roles and responsibilities.

SNBI Analysis

Table of Contents

Four commenters suggested adding the Item ID to the Expanded Table of Contents (TOC) as a cross reference to the item name, to make the TOC more useful and easy to use.

FHWA Response: FHWA agrees that this change would assist in navigating the SNBI and has added Item IDs to the Expanded TOC. Item IDs have also been provided in the index tables of appendix B for useful cross references between the item names, IDs, format, and document sections. The condensed and expanded TOCs are hyperlinked

throughout the document for ease of navigation; as are the item names in the index tables of appendix B.

Introduction

One commenter referenced the data relationship diagram (Figure 1). This commenter indicated that the element level data should be tied to each inspection event, rather than to each submission, thereby allowing the tracking of element condition over time, similar to the current practice for component condition ratings.

FHWA Response: Element level condition data and component condition rating data are considered inclusive of the results of all inspections performed since the last data submission to FHWA. All condition data can be tracked historically, as both element level and component condition data are collected during each data submission.

Definitions

As a result of changes made to the definitions for these terms in the final rule definitions were modified in the SNBI for *Bridge*, *Inspection Date*, *Operating Rating*, *Routine Inspection*, and *Safe Load Capacity*, and a definition was added for *Unknown Foundations*. Due to the addition of the *NSTM Inspection Required* and *Inspection Due Date* items, definitions were added for *Nonredundant Steel Tension Member Inspection* and *Inspection Due Date*. Because of changes made to the handling of border bridges, definitions were added for *Designated Lead State* and *Neighboring State*. To provide clarity for several items in the Highways subsection, a definition was added for *Divided Highway*. To provide clarity for the *Legal Load Rating Factor* item, the definition for *Legal Load* was expanded, and a definition was added for *Legal Load Rating*. The definition of *Initial Inspection* was simplified for clarity.

Two commenters expressed concern over the definition of *Nonredundant Member* causing confusion with *Nonredundant Steel Tension Member*.

FHWA Response: As the term *Nonredundant Member* is not used in the SNBI, it has been deleted from the Definitions section.

One commenter requested an additional definition for *Nonredundant Steel Tension Member* since only *Nonredundant Steel Tension Member Inspection* was originally included.

FHWA Response: For completeness, a definition from the final rule was added for *Nonredundant Steel Tension Member*.

One commenter requested clarification of the intent of the *Plan of Action* definition, asking that Scour be added to the term.

FHWA Response: FHWA agrees and the entry was changed to *Scour Plan of Action* and is consistent with the final rule.

One commenter requested clarification of the definition for *Rehabilitation*.

FHWA Response: After further consideration, definitions were developed for *Major Rehabilitation* and *Minor Rehabilitation* in place of the original *Rehabilitation* definition to coincide better with the codes for major and minor rehabilitation in the *Work Performed* item.

Two commenters requested clarification on the requirements for evaluated scour.

FHWA Response: Definitions for *Scour Appraisal*, *Scour Assessment*, and *Scour Evaluation* were added to provide more clarity and are consistent with the final rule definitions.

Three commenters requested clarification on the requirements of a service inspection.

FHWA Response: The definition for *Service Inspection* was updated with the definition used in the NBIS.

One commenter requested clarification on the requirements of a scour monitoring inspection.

FHWA Response: The NBIS requires a scour plan of action (POA) for all bridges that are determined to be scour critical. An important part of a scour POA is the monitoring program as indicated in Hydraulic Engineering Circular No. 23 (HEC-23) - Bridge Scour and Stream Instability Countermeasures: Experience, Selection, and Design Guidance, Third Edition. The monitoring program portion of the scour POA addresses the type and frequency of monitoring (i.e., inspection) required by the bridge owner. To ensure that the monitoring program within the scour POA is implemented, a *Scour Monitoring Inspection* type was created. Therefore, a definition for *Scour Monitoring Inspection* was created by FHWA and added to provide clarity.

One commenter suggested adding a definition for *Culvert*.

FHWA Response: Since Culverts were reinstated into the SNBI, a definition for *Culvert* was added. The *Culvert* definition was created by FHWA using the culvert definition from the 1995 NBI Coding Guide and modifying that definition to improve culvert bridge type reporting consistency.

Specification Format

Five commenters advocated for the use of a date format consistent with ISO 8601. ISO 8601 is the standard pertaining to date formats established by the International Organization for Standardization and can be located at <https://www.iso.org/iso-8601-date-and-time-format.html>.

FHWA Response: FHWA concurs with this recommendation and has adjusted the date format accordingly.

Five commenters expressed concern over the items that should not be reported where they do not apply, fearing that items might be forgotten rather than deliberately omitted, thereby affecting data quality.

FHWA Response: FHWA shares this concern, and allows omission of only those items where a null value can be verified by another means; a code of N is required for all

inapplicable condition rating items and for all items where applicability cannot be verified via other data items. This approach will help to minimize file sizes and reduce data processing times. FHWA has standardized data reporting requirements throughout the SNBI to the extent possible, as follows: 0 represents “none,” X represents “other,” and N or not reported represents “no” (N only), or “not applicable.” FHWA specifies only how the data should be reported to FHWA, not how data items should be recorded or stored in a bridge owner’s database.

Section 1: Bridge Identification

Subsection 1.1: Identification

The specification for the *Bridge Number* item was revised to emphasize that a bridge spans from abutment to abutment per the NBIS, and therefore multiple spans between abutments are to be reported as one bridge. This change was made primarily to address an ongoing issue where a limited number of State DOTs have been reporting a subset of spans as bridges, causing issues with other data items and resulting in inconsistent national reporting of bridge numbers.

Subsection 1.2: Location

Thirty-one commenters suggested that one State DOT should submit border bridge information for both States.

FHWA Response: To reduce the burden on States without inspection responsibility, a change was made to have the Designated Lead State submit a full bridge record and the Neighboring State submit an abbreviated bridge record. The Designated Lead State is determined through agreement between the two bordering States.

Twenty-three commenters remarked on the location where the measurements are taken for the *Latitude* and *Longitude* items. Some preferred the center of the bridge, others requested that the State be allowed to select the location, and some preferred the

proposed location of the beginning of the bridge on the edge of the right traveled way in the direction of the route mileage.

FHWA Response: In an effort to minimize burden, the specification for these items has been changed to indicate that the measurement should be taken at a location in accordance with agency procedures.

Five commenters were in favor of the decimals degrees format for the *Latitude* and *Longitude* items. Two requested the allowance of negative values.

FHWA Response: The examples for the *Longitude* item were updated to clarify that negative values are permitted.

Four commenters recommended eliminating the *Bridge Location* item.

FHWA Response: This item was retained, as it is the same as an item in the Coding Guide, and is easily transferred.

Five commenters recommended deleting the *Metropolitan Planning Organization* item. One commenter felt it was a positive addition.

FHWA Response: This item was retained because it can be used to assist in calculating Metropolitan Planning Organization performance measures and targets required by 23 CFR part 490.

One commenter asked whether the *Metropolitan Planning Organization* item included Regional Planning Organizations (RPOs).

FHWA Response: A note was added to the commentary to clarify that this item need not include the names of RPOs or single county planning organizations.

Subsection 1.3: Classification

One commenter requested an additional code for Bureau of Reclamation be added to the *Federal or Tribal Land Access* item.

FHWA Response: The additional code was added.

Five commenters asked that the *Toll* item codes be revised to line up with the *Toll* item (Item 20) in the Coding Guide.

FHWA Response: The codes were reorganized to line up with the Coding Guide. A code for “Bridge does not carry a toll road and is not a toll bridge” was also added, making the codes more easily transferable.

Thirteen commenters remarked on the *Emergency Evacuation Designation* item. Though most of the commenters indicated that there will be little value for this item from a State’s perspective, some do see the value for some other States to use this coding. Others felt it was a planning code, or there does not appear to be a significant/clear benefit to the addition of the code.

FHWA Response: The Emergency Evacuation Designation item is retained since this information will be beneficial in identifying potential impacts to emergency evacuation routes, and to regional and national freight and passenger mobility, if the serviceability of the bridge is restricted or diminished.

Section 2: Bridge Material and Type

Seventeen commenters noted the additional data requirements in the Bridge Materials and Type section and questioned the value in collecting the additional information required by the SNBI.

FHWA Response: NBI data are used by State DOTs, FHWA, and other Federal agencies to monitor and evaluate bridge performance, enhance bridge safety, and support risk management. Many of these users rely on identifying and classifying bridges by structural type. The Coding Guide only allows for the identification of superstructure type in the main and approach spans. The utility of inventory data for identification and classification purposes will be enhanced with more granular information on all superstructure and substructure materials and types present in a bridge.

Fifteen State DOTs and AASHTO objected to the removal of the culvert structure type by incorporating culverts into superstructure and substructure types and condition ratings.

FHWA Response: FHWA reconsidered the proposed approach and due to the comments, the SNBI is modified so bridge owners can uniquely identify a culvert bridge type using the *Span Configuration Designation* item, and a separate *Culvert Condition Rating* item is reinstated. However, FHWA emphasizes that the term “culvert” has a particular meaning for the SNBI and therefore *Culvert* is defined in the Definitions section of the SNBI. FHWA understands that bridge owner agencies may define this term differently as a program management tool, but for data submissions the FHWA definition must be used.

Subsection 2.1: Superstructure/Deck Material and Type (now Span Material and Type)

Ten commenters requested clarification on how to partition structural type data sets when complex groupings of main, approach, and widened superstructures and substructures may be present in a bridge.

FHWA Response: The intent of the specification is to classify and identify the different configurations of material, type, and design present on the bridge, regardless of where those configurations are located. Configurations need not be in contiguous spans or used to widen the same type of main or approach span to be considered part of the same span or substructure data set. The specifications and commentary were updated, and numerous examples were created, to clarify this intent.

Twelve commenters requested clarification on FHWA’s intended use of the *Number of Beam Lines* item.

FHWA response: This item will enhance FHWA’s oversight of the NBIP by identifying bridges that lack load path redundancy which, combined with other data items, can identify bridges with NSTMs.

Subsection 2.2: Substructure Material and Type

Three commenters requested clarification on the proper assignment of substructure type when a bridge has been widened and it may difficult to determine which substructure configuration is predominant.

FHWA response: To clarify intent, a third configuration designation for widening has been added to the *Substructure Configuration Designation* item.

Subsection 2.3: Roadside Hardware

Eighteen State DOTs and 1 Federal agency expressed concern with the addition of the *Bridge Railing* and *Transitions* items, and many of these commenters questioned the need for them. Most had concerns regarding the level of effort to collect detailed crash test data for a wide variety of existing bridge railings and transitions on a large number of bridges. Other concerns included the lack of data for railings on older bridges, the lack of familiarity that bridge inspectors have regarding standards for bridge railings and transitions, and the potential for error. Some suggested reverting to the *Traffic Safety Features* item (Item 36) in the Coding Guide, either in its current form or a modified version. Some recommended removing one or both of these items entirely, simplifying them significantly, or making them optional. One State DOT indicated that they collect data on rail types installed on all bridges and intend to migrate the data to meet this requirement. In addition, their State finds value in categorizing crash test level for the bridge railings.

FHWA Response: Bridge railings and transitions are very important traffic safety features that serve to redirect smoothly errant vehicles and reduce crash severity. These data items provide for more objective information to evaluate safety risks, whereas “meet currently acceptable standards” in the Coding Guide is neither clear nor well understood; FHWA believes that these data are very valuable for risk assessment. The information needed to determine the appropriate codes should be available in bridge records, as it is

also needed to report appropriately the applicable code for the *Bridge Railings* and *Transitions* items (Items 36A and 36B) in the Coding Guide. In addition, the AASHTO Manual, which has been incorporated by reference in the NBIS since January 2010, serves as a standard and provides uniformity in the procedures and policies for determining the physical condition, maintenance needs, and load capacity of the Nation's highway bridges. Article 2.3.1, regarding railings and parapets, indicates that the type and material of the railing/parapet, along with its dimensions, should be recorded. Article 4.8.4.6.1, regarding railings, indicates that they should be evaluated as to condition and as to adequacy of geometry and structural capacity, and that the inspector should be familiar with the railing requirements of the bridge owner. Article 4.3.5.11.4 in the AASHTO MBE, Third Edition, 2018, regarding approach guide rails and their transition to the bridge railing or parapet, indicates that agencies should ensure that inspectors are familiar with current agency standards for approach guide rail types, installation heights, and any minimum clearances, and check each approach guide rail assembly as to its conformance to current standards. Therefore, the information should also be available for agencies that follow the AASHTO MBE. In addition, bridge inspection related courses available through NHI contain course material on bridge railings. Finally, the inspector is not intended to be the only individual involved in identifying the appropriate code, similar to the coding of load rating items. These items may best be coded by the agency's safety engineer or other individual with appropriate expertise, and the inspector would field verify the installed configuration.

Five commenters recommended a code for "unknown" be added to the crash testing codes table to indicate that no information is known about the crash test level or an agency approved standard.

FHWA Response: The commentary for the *Bridge Railings* and *Transitions* items address the code to be reported when no information is known about the crash test level or an agency approved standard.

One State DOT recommended that code “0” (zero) in the crash testing codes table should be modified to read “required and none provided,” to help clarify the difference between codes “N” and “0.” Another indicated that examples were needed to clarify the difference between these two codes.

FHWA Response: The code 0 description was modified as suggested to make the code descriptions for “N” and “0” more self-explanatory without the need for further examples.

Two commenters requested clarification for reporting more than one code when there is a mixture of bridge railings or transitions on a bridge.

FHWA Response: The commentary for both items in this section was updated to clarify reporting of one applicable code when there is more than one type of bridge railing or transition.

One State DOT suggested that the nature of the *Bridge Railing* and *Transitions* items is more indicative of an appraisal item and should be moved to the Appraisal subsection. The commenter also suggested that the Bridge Railings item be integrated with National Bridge Element (NBE) items in the Element Conditions subsection.

FHWA Response: These items remain in the Bridge Material and Type section to be contained together with other related items that will likely be inventoried from plans. These items are considered a classification or categorization of the bridge railings and transitions, and not an appraisal. Bridge railing element data, in the element subsections, address condition and not crashworthiness. There is no NBE defined in AASHTO’s “Manual for Bridge Element Inspection” (MBEI), Second Edition, 2019 or the SNBI for bridge railing transitions.

Section 3: Bridge Geometry

Multiple commenters questioned the need for several items in this section. The more substantial comments pertained to the *NBIS Bridge Length*, *Minimum Span Length*, *Curved Bridge*, *Curved Bridge Radius*, *Maximum Bridge Height*, and *Irregular Deck Area* items.

Five commenters questioned the need for the proposed *NBIS Bridge Length* item.

FHWA Response: This item describes the dimension that is used to distinguish a bridge, as defined in the NBIS, from a structure that is shorter than a bridge. The referenced definition is used to identify bridges that are subject to the NBIS and must be reported to the NBI. The *NBIS Bridge Length* item (Item 112) in the Coding Guide had only a yes or no value, and has not sufficiently served its purpose of identifying NBIS bridges. To reduce the burden associated with this item, the value may be estimated when the *Total Bridge Length* item is 30 feet or greater.

Nine commenters questioned the need for the proposed *Minimum Span Length* item, and one acknowledged the need for the item.

FHWA Response: To date, only the maximum span length has been reported. It has been found that both maximum and minimum span length are needed for preliminary screening of bridges to identify impacts from changes in national load rating vehicles, or changes to truck sizes and weights (either proposed or mandated). Article C6A.4.4.2.1b of the AASHTO MBE, Third Edition, 2018 (with 2019 and 2020 interim revisions), recognizes this point, as it communicates that bridges with a rating factor greater than 1.35 for the AASHTO legal trucks will have adequate load capacity for special hauling vehicles only when the span lengths exceed the values specified therein.

Three commenters questioned the need for the proposed *Curved Bridge* item.

FHWA Response: This item indicates whether a bridge is comprised of girders that are curved or aligned to approximate a horizontal curvature. Curved bridges can

require different procedures and specifications for structural analysis and design, and for load rating analysis for legal and permit vehicles, including permit vehicle size restrictions. Curvature is also an attribute that can raise the importance of inspection, maintenance, and repair of certain members as compared to straight bridges. This in turn may impact risk-based inspection interval selection, inspection scope, and repair prioritization. Curvature can also affect the assessment of vulnerability to seismic events using system-level procedures. The *Curved Bridge* item has been retained, but has been revised to address comments asking for clarification about the difference between a curved bridge comprised of curved versus chorded girders.

Nine commenters questioned the need for the proposed *Curved Bridge Radius* item.

FHWA Response: FHWA acknowledges that the radius of curvature alone is often insufficient for decision-making, and procedures will frequently require obtaining this information from drawings or files in conjunction with other details. This item has been removed.

Fourteen commenters questioned the need for the proposed *Maximum Bridge Height* item. Multiple commenters also questioned the need to update the reported value for this item when maximum height occurs over water that has a fluctuating bed elevation.

FHWA Response: Bridge height is an attribute that can inform multiple procedures, including inspection planning to identify access equipment needs, seismic vulnerability assessments, and cost estimation associated with work types or needs. To reduce the burden associated with this item, and to facilitate identification of bridges with limited clearance over water, the specification for this item has been revised so that measurement is from the top of deck to the ground line or water surface, whichever yields a higher value.

Two commenters questioned the need for the proposed *Irregular Deck Area* item.

FHWA Response: This item allows an agency to report the deck area of a bridge when using the values reported for *Total Bridge Length* and *Bridge Width Out-to-Out* does not provide an accurate representation. Deck area is used to support multiple procedures including the calculation of performance measures and the implementation of 23 CFR part 490.

Section 4: Features

Subsection 4.1: Feature Identification

The *Feature Type* item was revised to add a numeric sequential field for each feature, for ease of State and FHWA tracking of multiple features of the same type, and to address confusion expressed by several commenters.

Several commenters asked how many features below a bridge are to be identified for the *Feature Type* item, and if at least one is required.

FHWA response: The commentary for this item was updated to indicate that at least one feature is to be identified both on and below the bridge, and that many bridges will have more than one. However, a code of “D” (dry terrain) or “B” (urban feature) need be reported only once, if applicable.

A few commenters stated that reporting multiple features for bridges would be excessive burden for questionable benefit.

FHWA response: FHWA believes that for most bridges, the majority of features will already be known by inspection teams and will need to be input but not collected. For some bridges, it is acknowledged that some data will need to be collected, but only one time over the life of the bridge except in rare cases where another feature is built above, on, or under the bridge. Highway features under structures that are not bridges per the NBIS will no longer be reported to FHWA, providing a decrease in burden.

Subsection 4.2: Routes (now Subsection 4.2 Routes and Subsection 4.3 Highways)

Several commenters expressed concern with the perceived increase in the amount of route data to be reported. A few noted that many of the items in the Routes section are actually associated with the highway, which can carry multiple routes, and therefore should be collected and reported only once for each highway.

FHWA response: FHWA agrees with the commenters, and this subsection has been divided accordingly. Highway-related items were removed from the Routes subsection and placed in a separate Highways subsection, where each item will be reported once for each highway feature associated with the bridge. For a highway feature crossing above a bridge, only the *Crossing Bridge Number* item need be reported, because the highway feature above will always be a bridge. Therefore, the remaining highway and route information can be accessed via the data associated with the crossing bridge record. This also applies when the highway feature directly below an inventory bridge is a crossing bridge. The Routes subsection now contains only five route-related items, which will be reported for each route associated with the highway feature.

Subsection 4.3: Railroads (now Subsection 4.4)

Six commenters questioned the need for the proposed *Railroad Service Type* item.

FHWA Response: This item distinguishes between passenger and freight services and between electrified and non-electrified rail lines. It is useful for inspection planning to identify access and coordination needs.

Two commenters suggested that the data for the items in this section should be obtained by FHWA from national databases maintained by the Federal Railroad Administration, for example.

FHWA Response: Agencies can use available resources to assist in coding the *Railroad Service Type* item. However, national databases do not necessarily include sufficient data to report all bridge related railroad items, or include information for all categories of railroads.

Subsection 4.4: Navigable Waterways (now Subsection 4.5)

Four commenters questioned the need for the *Navigation Channel Width* and *Navigation Channel Minimum Horizontal Clearance* items, as these items are not currently reported to the NBI.

FHWA Response: The data items in this section are used to identify bridges that cross navigable waterways and are at risk of vessel collision, which will assist FHWA in identifying risks to highway bridge safety. The *Navigation Channel Width* item and *Navigation Channel Minimum Horizontal Clearance* item clarify the requirements for data currently reported for the *Navigation Horizontal Clearance* item (Item 40) in the Coding Guide. These data should be available from the navigation permit drawings required for all bridges over navigable waterways.

Section 5: Loads, Load Rating, And Posting

Subsection 5.1: Loads and Load Rating

Four commenters requested clarification on how to assign codes for the *Design Method* item when no plans exist for a bridge.

FHWA Response: The commentary for this item addresses this situation, allowing for bridge owners to infer which design method was in use at the time the bridge was built based on the characteristics of the bridge and design policy in effect at the time of construction.

Six commenters disagreed with the requirement to truncate load rating factors to the nearest hundredth rather than allowing values to be rounded.

FHWA Response: The load rating factor is calculated as a ratio of other values that have their own accuracy and precision. Truncating such a value to the hundredth will assign precision in a conservative fashion that will vary from the calculated rating factor by, at most, 1 percent.

Seven commenters requested clarification on FHWA's intended use for the *Controlling Legal Load Rating Factor* item.

FHWA Response: Many States and local agencies have their own legal load combinations that they must consider in addition to the nationally recognized AASHTO Legal Loads when load rating bridges. There is wide variety in the axle weights and spacings of these legal loads, making it impractical to define every combination in the SNBI. However, the rating factor is a universal value representing a ratio of capacity to demand, with 1.0 being the minimum value indicating a bridge's ability to carry safely a given legal load configuration. By identifying the minimum calculated rating factor of all legal loads considered in the load rating, the *Controlling Legal Load Rating Factor* item serves the purpose of improving NBIP oversight by identifying bridges that require posting, based on their ability to carry State legal loads that may vary from those established by AASHTO.

Ten commenters requested clarification on FHWA's intended use of the *Routine Permit Loads* item.

FHWA Response: The NBIS requires States to post or restrict bridges that cannot safely carry routine permit loads as demonstrated through a valid load rating. This item identifies bridges that carry routine permit loads, to differentiate between bridges that do and do not require that the posting analysis consider those loads.

Subsection 5.2: Load Posting Status

Eight commenters recommended corrections and changes to the table of load posting status codes in the *Load Posting Status* item.

FHWA Response: The table has been updated to incorporate many of the recommendations to remove similar codes, and to differentiate between bridges that are currently open with no restrictions and require posting, and those that are currently posted but require a posting reduction.

One State DOT requested clarification on the definition of temporary and supported structures and when those conditions will result in a change in the *Load Posting Status* item that will be reported to FHWA.

FHWA Response: The specification for this item was updated to include more detailed descriptions of temporary and supported conditions, and expectations for the length of time those conditions are expected to be in place to be considered in the reporting of this item.

Subsection 5.3: Load Evaluation and Posting

Ten commenters requested clarification on whether State-specific legal loads need to be reported for the items in this subsection.

FHWA Response: Given the large number of State-specific legal load configurations, it is not feasible to include non-AASHTO-defined legal loads for the items in this subsection. However, the load rating evaluation must consider all legal loads operating in the State and if a State-specific legal load configuration results in the lowest rating factor from the evaluation, that value will be reported in the *Controlling Legal Load Rating Factor* item.

Five commenters requested clarification on whether AASHTO legal loads that are not evaluated because their force effects are enveloped by another AASHTO load (for instance, the Notional Rating Load (NRL)) need to be reported for the items in this subsection.

FHWA Response: The introduction to the Load Evaluation and Posting subsection states that “Data items in this subsection are reported for each AASHTO legal load configuration evaluated, only when the bridge has undergone a posting analysis.” If the posting analysis uses the NRL to screen out the need to evaluate individually other loads, there is no need to rate and report data for those vehicles.

Section 6: Inspections

Subsection 6.1: Inspection Requirements

Eight commenters were concerned with the level of effort to collect the information for the *Fatigue Prone Details* item.

FHWA Response: This item has been renamed to *Fatigue Details*. Category D details were removed from the data collection requirement, thereby reducing the burden.

Subsection 6.2: Inspection Events

Three commenters recommended deletion of Service (Code 8) for the *Inspection Type* item, as they did not consider that it was needed.

FHWA Response: Service inspection type is needed for risk based extended intervals as part of the NBIS.

Four State DOTs requested definitions clarifying the intent of the inspection types.

FHWA Response: Definitions for each of the inspection types are included in the Definitions section.

Fourteen commenters requested clarification on the *Nationally Certified Bridge Inspector* item, as to how the unique identifier certifications will be assigned and who is responsible for assigning them. Many questioned the need for this item or suggested that it should be the responsibility of FHWA to certify inspectors.

FHWA Response: The commentary was updated to indicate that the unique identifier code is assigned by the State DOT, Federal agency, or Tribal government. FHWA does not certify bridge inspectors.

Four commenters questioned the need for the *Inspection Interval Type* item, as it can easily be determined from the *Inspection Interval* item.

FHWA Response: FHWA agrees, and the *Inspection Interval Type* item has been removed.

Two commenters requested the addition of a calculated *Inspection Due Date* item.

FHWA Response: This item has been added to identify the next inspection due date.

Eleven commenters requested clarification as to the need for the *Inspection Quality Control Date* and *Inspection Quality Assurance Date* items. Several of these commenters also requested that the commentary language be adjusted to allow an independent QC or QA review from outside the agency.

FHWA Response: These items will ensure that information on QC and QA procedures is available to FHWA for oversight of the NBIP. FHWA agrees that an independent review from outside the agency can also be part of a QC or QA program; the commentary language for both items has been adjusted as requested.

The name of the *Inventory Update Date* item has been changed to *Inspection Data Update Date*, as that better aligns with the intent of the item and may help alleviate confusion expressed by some commenters.

Ten State DOTs questioned the need for the *Inspection Equipment* item.

FHWA Response: FHWA requires this information to verify that a quality inspection is performed.

Three commenters questioned the need for the *Inspection Note* item.

FHWA Response: This item is used to explain what portions of the bridge were inspected when a partial inspection is performed and not a full bridge inspection.

Section 7: Bridge Condition

Subsection 7.1: Component Condition Ratings

Fifteen State DOTs and AASHTO objected to the incorporation of culverts into superstructure and substructure types and condition ratings.

FHWA Response: These comments were addressed in the Section 2 (Bridge Material and Type) comment responses.

Ten State DOTs and AASHTO felt that the changes to the component condition rating code descriptions made them too complex or prescriptive and too similar to the AASHTO element level descriptions; most felt that the meaning of the component condition rating codes had changed significantly from the Coding Guide. Another State DOT suggested eliminating component condition ratings entirely based on the similarity of the descriptions to the element data descriptions. Two commenters appreciated the detailed guidance, and three appreciated the clarity of the Specifications and Commentary.

FHWA Response: FHWA agrees that these codes became overly complex in the draft document. The intent was to clarify the component condition language from the Coding Guide without significantly changing the meaning. To that end, the optional detailed guidance tables have been moved to the Appendix and the condition language has been simplified.

Seven commenters suggested that the guidance provided in the guidance tables precluded improvement of a concrete bridge component from fair to good condition if effective repairs were completed; they did not feel that a sound patch should be considered a defect.

FHWA Response: A patched area that is sound is in fair condition per the AASHTO MBEI; the guidance provided in the tables for evaluating the condition of concrete components is consistent with that determination.

Ten commenters had some difficulty locating descriptions of terms and other specific guidance within the section, or requested clarification of certain requirements.

FHWA Response: Key terms are defined in the introduction to the section and in the Definitions section, requirements have been clarified as needed, and the optional detailed guidance tables have been moved to the Appendix.

Thirteen State DOTs and one association questioned the need for the *Bridge Railing Condition Rating*, *Bridge Railing Transitions Condition Rating*, *Bridge Bearings Condition Rating*, and *Bridge Joints Condition Rating* items, particularly since they are collected with the element data. Three commenters expressed support for these items.

FHWA Response: Element level condition data, in accordance with MAP-21, are required to be reported only for bridges on the NHS. Therefore, these data do not exist for a large percentage of the NBI. These new items in the SNBI will serve to ensure the safety of all highway bridges.

Four State DOTs objected to the addition of the *Scour Condition Rating* item, not appearing to understand its relationship with the *Scour Vulnerability* item. Three commenters expressed support for the change.

FHWA Response: These comments are addressed below in the Subsection 7.3 (Appraisal) comment responses.

Two commenters objected to the separation of the *Channel Condition Rating* and *Channel Protection Condition Rating* into two items; one embraced the change.

FHWA Response: FHWA believes that the separation will improve clarity regarding channel condition. No change has been made.

Ten commenters objected to the inclusion of the *Bridge Condition Classification* and *Lowest Condition Rating Code* items.

FHWA Response: These items are calculated by FHWA and are not required be collected or reported by the bridge owner. These items are related to national bridge performance measures and are provided in the SNBI for transparency.

Six State DOTs expressed concern over the assumption that a structural or hydraulic review, or both, must have been completed for a condition rating of 4 or less, and what that review might entail.

FHWA Response: FHWA has clarified the requirement and added definitions for “structural review” and “hydraulic review” in the Definitions section.

Two commenters objected to the language for a condition rating of 4 or less that states that the strength or performance of the component is affected.

FHWA Response: A rating of 4 or below indicates Poor condition, which is defined as affecting the strength or performance of a bridge. No change was made to this language.

One State DOT requested guidance on insignificant defects.

FHWA Response: As insignificant defects do not affect the rating of a bridge component, no guidance is offered. An insignificant defect is one that is less than minor.

Four State DOTs objected to the statement that the wearing surface should not be considered in determining the *Deck Condition Rating* code. One of these State DOTs also requested clarification of situations with integral wearing surfaces and decks where the underside cannot be seen.

FHWA Response: The commentary has been updated to address these situations and add clarity regarding wearing surfaces.

Subsection 7.2: Element Conditions (now Subsection 7.2 Element Identification and Subsection 7.3 Element Conditions)

Three commenters indicated support for the inclusion of element level bridge data items, seven requested clarification regarding reporting of these data for bridges not on the NHS, two were not in favor if this resulted in duplicative reporting, and two were opposed.

FHWA Response: As required by 23 U.S.C. 144, State and Federal agencies have been reporting element level data to FHWA for bridges on the NHS since April 2015 using guidance provided in the SNBIBE. The guidance in the SNBIBE is now included in the SNBI and will not cause duplicative reporting of element data, as the SNBIBE will

be discontinued when the SNBI becomes effective. The introductions to the Element Identification and Element Condition subsections have been updated to clarify further that element level data are only required to be reported to FHWA for bridges that carry NHS routes, while reporting is optional for bridges that carry non-NHS routes.

Two State DOTs recommended deletion of the culvert elements, since the *Culvert Condition Rating* item (Item 62) in the Coding Guide was proposed to be discontinued in the SNBI. One State DOT requested clarification on the intent of these elements, given the discontinuance.

FHWA Response: The culvert elements have been retained in the SNBI, as FHWA has reinstated the *Culvert Condition Rating* item, and has made provisions in the Bridge Material and Type section to accommodate bridge-sized culverts.

Two commenters proposed revisions to the bridge elements table.

FHWA Response: The proposed changes were not accepted since FHWA agreed with AASHTO to adopt the AASHTO MBEI for element descriptions, quantity calculations, and condition state definitions. The bridge elements table title was revised to “Bridge elements reported to the FHWA” since there are some elements described in the AASHTO MBEI that are not reported to FHWA.

One commenter requested clarification for reporting elements that are typically not exposed for inspection (*e.g.* piles, pile cap footings), but become exposed for an inspection, and are subsequently not exposed for the next inspection.

FHWA Response: Text has been added to clarify reporting expectations for this situation, and provides for agency flexibility in reporting the element data.

One commenter proposed that element level data be reported separately, as the file size may become an issue if all data in the SNBI is reported together in one file.

FHWA Response: FHWA will consider and evaluate potential solutions to provide options for reporting large data files.

One commenter proposed that changes be made to FHWA's proposed expectations, in the introduction to the Element Conditions subsection, that quantities reported to FHWA in condition state four indicate that a structural review has been completed.

FHWA Response: FHWA did not intend to change the condition state description in the AASHTO MBEI for condition state four, that indicates the following: "The condition warrants a structural review to determine the effect on strength or serviceability of the element or bridge; OR a structural review has been completed and the defects impact strength or serviceability of the element or bridge." Since it may not be practical in all cases for a structural review to be completed prior to reporting data to FHWA, based on the timing of the inspection and the completion of a structural review, the paragraph of concern to the commenter has been removed.

One commenter proposed that the SNBI include the FHWA relationship checks between element numbers and element parent numbers.

FHWA Response: The relationship checks by FHWA are not included in the SNBI, but can be found on the internet through FHWA's Policy and Guidance Center at www.fhwa.dot.gov/pgc.

One commenter proposed that it would be easier to understand if the Item ID for *Element Quantity Condition State* items ended in 1, 2, 3, and 4 respectively.

FHWA Response: The Element Conditions section has been separated into two subsections, Element Identification and Element Conditions. As a result, Item IDs for *Element Quantity Condition State* items have changed to B.CS.01, B.CS.02, B.CS.03, and B.CS.04.

Subsection 7.3: Appraisal (now 7.4)

One State DOT noted that the Coding Guide appraisal rating items are all rated on a scale of 0-9 and expressed concern that the proposed changes to the codes would affect

the historic continuity of these items. It was further suggested that the proposed alphanumeric codes provide no obvious meaning without referring back to the guidance, and would incur substantial cost with questionable value. One State DOT appreciated the proposed changes to the *Approach Roadway Alignment* and *Overtopping Occurrence* (now *Overtopping Likelihood*) items; indicating that the items are much simpler. One commenter indicated that the addition of the *Scour Plan of Action* item will clear up confusion and help to alert inspectors and others that the bridge has a POA.

FHWA Response: The SNBI includes two new data items in the Appraisal subsection, which provide additional information about potential bridge vulnerabilities: *Scour Plan of Action* and *Seismic Vulnerability*. The *Approach Roadway Alignment*, *Overtopping Likelihood* (formerly *Waterway Adequacy*), and *Scour Vulnerability* (formerly part of *Scour Critical Bridges*) items have been carried over from the Coding Guide, but with new codes that are simpler, clearer, and easier to understand. Since these items typically do not change from inspection to inspection, and the crosswalk of data is well aligned, the historical continuity can be maintained, and the cost will not be substantial. The following calculated appraisal items from the Coding Guide have been discontinued: *Structural Evaluation* (Item 67), *Deck Geometry* (Item 68), and *Underclearances, Vertical and Horizontal* (Item 69).

Four commenters recommended removal of the *Overtopping Occurrence* item, largely due to concerns about potential inaccuracy of the data. One commenter proposed a two-character field indicating the number (01 to 99) of overtopping occurrences, presumably since construction.

FHWA Response: The name of this item has been changed to *Overtopping Likelihood* and the codes and descriptions changed accordingly. This information is valuable for evaluating risk-based inspection intervals, evaluating risks for traffic disruptions, identifying actions to mitigate risks, and as an indicator of changes to the

waterway hydraulics that could impact the safety and performance of the bridge. The information for reporting the applicable code should be readily available, as similar information was needed to report the appropriate code for the *Waterway Adequacy* item (Item 71) in the Coding Guide.

One commenter requested clarifying commentary for the *Overtopping Occurrence* item to address more clearly bridges where the superstructure has been washed off the abutments and repairs are made without betterments, thereby leaving the bridge at the same elevation and the same likelihood for overtopping. Three commenters proposed the addition of a code for “unknown.”

FHWA Response: Additional commentary has been provided to address considerations for determining the appropriate code for existing and newer bridges. Recognizing that an “unknown” code was not provided in the Coding Guide, and that the relevant information should be available in the agency’s bridge file, a code for “unknown” has not been added.

Four State DOTs objected to the addition of the *Scour Condition Rating* item, not appearing to understand its relationship with the *Scour Vulnerability* item. Three commenters expressed support for the separation of the *Scour Critical Bridges* item (Item 113) in the Coding Guide into these two distinct items. Several requested clarification regarding the relationship between the code descriptions in the Coding Guide and those in the *Scour Vulnerability* item. Some commenters requested additional codes or clarification regarding coding for specific situations; one requested clarification as to what will be considered “scour critical.” One State DOT expressed concern that the changes would require a large number of bridges to be reassessed, and one indicated concern regarding the resources that would be required to perform rigorous scour studies on locally owned bridges.

FHWA Response: The *Scour Vulnerability* and *Scour Condition Rating* items are intended to separate potential for scour from field observed scour (severity and extent). The *Scour Vulnerability* item addresses the scour critical status and vulnerability determination from scour appraisals required by the NBIS, while the *Scour Condition Rating* item captures the actual scour condition as observed during the inspection. Though the items and codes have been changed, there is significant correlation with the code descriptions for the *Scour Critical Bridges* item (Item 113) in the Coding Guide (Errata 12/01/2003). The codes and descriptions have been revised for clarity and for consistency with the NBIS definition of a scour critical bridge, and additional commentary has been provided to improve further correlation between the SNBI codes and those in the Coding Guide. It is not expected that these changes will require any bridges to be reassessed or reevaluated for scour, unless there are conditions that trigger a need for adjustments to the original scour appraisal. Alignment of the codes will be addressed in the crosswalk, which will be made available in the coming months.

Two commenters recommended a separate code indicating that a scour POA has been developed but not implemented.

FHWA Response: The code descriptions for the *Scour Plan of Action* item have been revised to accommodate this situation.

Three State DOTs questioned the need for the *Seismic Vulnerability* item. One of these commenters indicated that coding the item would require significant resources for low value, and another suggested simplifying the item.

FHWA Response: This item provides available information resulting from seismic evaluation and retrofit programs that an agency may have performed of its own volition. This item, along with other supporting items, can aid in risk assessment and potential needs assessment for bridge preservation funding from a national perspective. The codes for the item allow for broad interpretation based on the reporting agency's

methods and evaluation criteria. Seismic evaluation studies should already be part of an agency's bridge record/file per Article 2.2.13 of the AASHTO MBE, First Edition, 2008, incorporated by reference in the NBIS since January 2010. Bridges with seismic retrofit should not require a significant amount of time to identify from bridge files if the agency is following Article 4.3.5.7.1 of the AASHTO MBE, Third Edition, 2018, which outlines procedures for inspection of seismic restraint devices. The SNBI provides a code that can be used if an agency has bridges that do not require seismic evaluation due to low anticipated ground motion or agency prioritization.

Subsection 7.4: Work Events

Twelve commenters questioned the need for the proposed *Construction Cost* item. Multiple commenters also said the data would be difficult to obtain or implied that the data would also need to be reported for replacement and rehabilitation projects that occurred prior to implementation of the SNBI.

FHWA Response: The item has been removed based on these comments.

Subpart D- Highway Bridge Replacement and Rehabilitation Program

One commenter requested that subpart D not be removed and that FHWA keep the sufficiency rating used in previous NBIS regulation as it provides a process for prioritizing bridge rehabilitation and replacement projects. By making the change the State will need to undertake significant effort to revise the Federal funding prioritization process for bridges.

FHWA response: It is not the intent of FHWA to revise a prioritization process with the removal of subpart D. This subpart was removed as the Highway Bridge Program was not reauthorized by MAP-21. The MAP-21 restructured core highway formula programs. Activities that were carried out under the Highway Bridge Program were incorporated into the National Highway Performance Program and the Surface Transportation Program (now Surface Transportation Block Grant Program). Sufficiency

rating is not used by FHWA for funding or prioritization of projects. States have the ability to establish their own process for prioritizing projects or to continue using the sufficiency rating method if so desired.

Discussion under 1 CFR Part 51

FHWA is incorporating by reference the more current versions of the manuals listed herein.

AASHTO's 2008 "Manual for Bridge Evaluations," would be replaced with a more current edition of the "AASHTO Manual for Bridge Evaluation." Specifically, FHWA is incorporating by reference Sections 1.4, 2.2, 4.2, 6, and 8, excluding the 3rd paragraph in Article 6B.7.1 of the 2018 Third Edition, together with the 2019 and 2020 Interim Revisions of these sections. This document was developed by AASHTO to assist bridge owners by establishing inspection procedures and evaluation practices that meet FHWA's National Bridge Inspection Standards regulatory requirements. The manual is been divided into eight sections, with each section representing a distinct phase of an overall bridge inspection and evaluation program.

In addition, FHWA adds the AASHTO MBEI. This document is a reference for standardized element definitions, element quantity calculations, condition state definitions, element feasible actions, and inspection conventions. Its goal is to capture the condition of bridges in a simple, effective way that can be standardized nationwide, while providing enough flexibility to be adapted by both large and small agencies. AASHTO designed the document for use by State departments of transportation and other agencies that perform element-level bridge inspections. This reference supports the Section 1111(a) of MAP-21 for element level data to be reported to FHWA for bridges on the NHS. The AASHTO MBEI is referenced in FHWA's "Specification for the National Bridge Inventory Bridge Elements," and would establish a uniform

understanding of the inventory data to be reported in order to satisfy the statutory requirement.

Finally, FHWA incorporates by reference FHWA's "Specifications for the National Bridge Inventory", 2022. The SNBI details how to code and submit data gathered on highway bridges for the NBI, including items on location, structure type, condition ratings, and inspection dates. This document replaces the current Coding Guide and defines the required inventory data that is submitted to FHWA to fulfill the requirements of § 650.315.

The documents that FHWA is incorporating by reference are reasonably available to interested parties, primarily State DOTs, local agencies, and Tribal governments carrying out Federal-aid highway projects. These documents represent the most recent refinements that professional organizations have formally accepted and are currently in use by the transportation industry. The documents incorporated by reference are available on the docket of this rulemaking and at the sources identified in the regulatory text below. The specific standards are discussed in greater detail elsewhere in this preamble.

Executive Order 12866 (Regulatory Planning and Review), Executive Order 13563 (Improving Regulation and Regulatory Review), and DOT Regulatory Policies and Procedures

The final rule is a significant regulatory action within the meaning of Executive Order (E.O.) 12866 and DOT Rulemaking and Guidance Procedures in DOT Order 2100.6A (June 7, 2021). This action complies with E.O. 12866 and E.O. 13563 to improve regulation. This action is considered significant because of widespread public interest in the safety of highway bridges, though not economically significant within the meaning of E.O. 12866. FHWA has filed into the docket a Regulatory Impact Analysis (regulatory analysis or RIA) in support of the final rule on NBIS. The RIA estimates the

economic impact, in terms of costs and benefits, on Federal, State, and local governments, as well as private entities regulated under this action, as required by E.O. 12866 and E.O. 13563.

This section identifies the estimated costs and benefits resulting from the rule in order to inform policy makers and the public of the relative value of this action. The complete RIA may be accessed from the rulemaking's docket (FHWA-2017-0047).

The docket for the rulemaking included an RIA analyzing the economic impacts of the proposed rule. The NPRM received 256 comments in relation to the NBIS and the SNBI, some of which pertained to the RIA.

This RIA has been updated to reflect public comments provided in response to the NPRM RIA. The RIA comments came exclusively from State agencies and related to absence of cost estimation for the changes to the SNBI. In particular, States estimated that they will incur costs due to the SNBI changes, including the following issues:

- The increased costs associated with updating software and software systems to accommodate additional data or recoding of existing variables.
- The increased costs associated with inspections due to the additional inspection categories in the updated SNBI compared to the existing coding guide.
- The increased cost associated with updating inspection manuals and inspector trainings to be consistent with the updated SNBI.

In response to those concerns, this RIA has been updated to include estimates of the additional cost associated with the SNBI changes. The specific adjustments are detailed in Section 4.3 of the RIA found on the docket for this rulemaking.

Additionally, States were concerned that the NPRM RIA did not address the benefits of the proposed rule. The RIA has also been updated to include a qualitative discussion of those benefits.

In addition to the changes made in response to the public comment, a number of input values to the economic analysis have been updated in this final rule RIA compared to the NPRM RIA. The updates include:

- The effective date of the rule has been changed to 2022 rather than 2020. This changes the period of analysis from 2020-2029 to 2022-2031.
- The wage rates have been updated to the 2019 values from the 2016 values used in the NPRM RIA.
- Rather than analyzing the cost savings from assuming 1 percent of eligible bridges use the expanded inspection interval as was used in the NPRM, this economic assessment uses uncertainty analysis in relation to the share of bridges that are expected to use the Method 1 extended interval of 48 months which requires a simplified risk inspection and the Method 2 extended interval of up to 72 months under Method 2 which requires a detailed risk inspection (compared to the currently required 24-month interval). The FHWA anticipates that agencies will infrequently use the Method 2 for intervals greater than 48 months and that a plausible range for the share of bridges inspected under Method 1 is 30 to 65 percent. That range is based on data on the number of States that currently use the 48-month exception for any bridges/culverts,¹⁶ public comment from the NPRM, and other information about State agencies practices (e.g., State law and Transportation Asset Management Plans (TAMPs)). The justification for this

¹⁶ Under existing NBIS policies, an agency may request that a bridge may be inspected under a 48-month inspection interval based on relatively stringent requirements which excludes bridges: with any condition rating of 5 or less; (b) that have inventory ratings less than the State's legal load; (c) with spans greater than 100' in length; (d) without load path redundancy; (e) that are very susceptible to vehicular damage, e.g., structures with vertical over or underclearances less than 14'-0", narrow thru or pony trusses. The requirements for a 48-month inspection frequency policy are described in the FHWA Technical Advisory T 5140.21 dated September 16, 1988. This document is available on-line at: <https://www.fhwa.dot.gov/reports/techadvts.cfm>.

range is described more fully under Section 3 of the RIA under Section 650.311:

Inspection Interval.

- The share of bridges that currently use a 24-month interval that are expected to use a 12-month interval is 100 percent, reflective of the requirement of the rulemaking. This provision is new to the final rulemaking and was not included in the original NPRM RIA.
- The cost of inspections has been updated. The NPRM RIA assumed that on average a regular inspection required 4 hours of engineer time to complete at a total cost of \$257.¹⁷ Based on public comment,¹⁸ available inspection cost data, interviews with Federal and State agencies, and FHWA program office input, the final rule RIA updates the average cost per bridge inspection to be \$2,000. The justification of this average inspection costs is detailed in Section 4.2 of the RIA.

Estimated Cost of the Final Rule

To estimate costs for the final rule, FHWA assessed the level of effort, expressed in labor hours and the labor categories, and capital investments needed to comply with each component of the rule. Level of effort by labor category is monetized with loaded wage rates to estimate total costs.

The rulemaking will impose some additional costs on agencies but will also create opportunities for cost savings. The cost savings are due to the risk-based inspection interval approach that allows for a potentially large number of bridges that currently use a 24-month inspection interval to use Method 1 48-month inspection interval instead. The actual number of bridges for which this expanded inspection interval will be adopted is

¹⁷ The total cost of inspection used in the NPRM RIA was estimated using the average loaded wage rate for civil engineers in 2016 from BLS (\$64.19) and an assumption of 4 hours per inspection (4 hours x \$64.19 = \$257.76 in 2016 dollars).

¹⁸ Comments from NYSDOT. FHWA-2017-0047-0138. Accessible from: <https://www.regulations.gov/document?D=FHWA-2017-0047-0138>

unclear; therefore, this assessment uses an uncertainty analysis on this key parameter.

FHWA judges a plausible range to be that 30 to 65 percent of eligible bridges will use the Method 1 48-month risk-based inspection interval rather than a 24-month inspection interval. The informational basis for this range is described in RIA Section 3 under Section 650.311: Inspection Interval.

While the rulemaking provides cost saving on net, there are several components of the rule that increase costs. The largest cost increases come from the impacts of the updated SNBI (§ 650.315), which will require States to upgrade software systems, update inspection manuals, train inspectors, and will increase the hours required for inspection for all bridges for the first inspection after the compliance date of the provision. The other important source of cost increases come from the risk-based approach requirement that some bridges will be inspected at 12-month intervals rather than the current 24-month intervals, which will increase the frequency of inspections and therefore increase costs.

Table 1 displays the total cost of the final rule (2019\$) for the 10-year analysis period (2022 – 2031) assuming that either 30 or 65 percent of eligible bridges will use the Method 1 risk-based 48-month inspection interval rather than the 24-month inspection interval. The total cost savings of the rule for the 10-year study period (2022 – 2031) is between -\$4.6 and -\$195.4 million discounted at 7 percent.

The provisions required by MAP-21 (§§ 650.303, 650.309, and 650.313) have total cost of \$7.1 million over the 10-year analysis period when discounted at 7 percent. The other discretionary provisions that impose costs have a 10-year discounted value of -\$11.7 to -\$202.5 million. The cost savings associated with the provision related to expanded inspection intervals has a plausible range for 10-year discounted costs of -\$131.0 to -\$321.7 million.

Estimated Benefits of the Rule

The FHWA believes the rule will be net beneficial to society but is unable to monetize or quantify the benefits of this rulemaking. These benefits are centered around bridge safety, which was the original premise for developing this regulation when it was initiated in 1971. This regulation will result in more consistent inspections and output from bridge inspections, better-qualified inspection personnel, and more robust reporting on structural and safety related deficiencies found during bridge inspections.

The benefits are separated into two categories: the benefits due to the NBIS changes and the benefits due to the SNBI changes. The FHWA believes that the benefits of each provision outweigh its costs. The NBIS changes will reduce the risk of negative safety impacts from sudden bridge deterioration of bridges at lower condition ratings, produce more consistent outputs from bridge inspections, enable better qualified inspection personnel, and result in more consistent reporting on structural or safety-related deficiencies. At the same time, FHWA does not expect that the rule will result in any safety disbenefits due to increased inspection intervals for some bridges. The SNBI changes are necessary for FHWA's required reports to Congress and will provide FHWA with additional data by including additional data elements in their ongoing bridge safety analysis practices which support various bridge safety programs including oversight of the NBIS and supporting the development of emergency response plans.

The safety benefits of the rule primarily come from the requirement for increased inspections for safety critical bridges, which are required to be inspected at a 12-month interval rather than the current 24-month interval. These increased inspections are expected to result in agencies identifying deteriorating conditions on bridges sooner than under the current rule. By identifying those conditions sooner, agencies can take safety mitigation measure more quickly. Those mitigation activities could include: repairs, reducing allowed load weights, reducing traffic volumes on the bridge through lane closures, or bridge closures. By taking those actions sooner, the agencies will better

protect the asset and the traveling public. However, those benefits are difficult to quantify.

The FHWA does not believe there will be safety disbenefits due to any provision of the rule. While the final rule allows agencies to increase the inspection interval from 24 months to 48 months for bridges that have condition ratings of 6 or above under method 1, it does not require them to do so. The expectation is that States would choose to use the Method 1 48-month interval in low-risk situations. Similarly, Method 2, which allows inspection intervals up to 72 months if the bridge passes a detailed risk analysis, is not required. The expectation is that agencies will rarely choose the Method 2 72-month interval, e.g., maybe on pre-stressed single-span concrete bridges with low vehicle volume over low-risk streams. Agencies would not use Method 2 simply because a bridge has a high condition rating, e.g., new bridges. If a specific bridge experienced an event that might cause its condition to change suddenly such as an adverse weather event, a strike, or construction activity, the agency will still be required to conduct initial and special inspections under § 650.311(d) of the regulations. The rulemaking follows the recommendations of the NCHRP Report 782, Proposed Guideline for Reliability-Based Bridge Inspection Practices which demonstrated and verified that inspection intervals of 72 months (24 months longer than the proposed rulemaking) will be suitable for certain bridges based on their risk profiles.¹⁹

¹⁹ National Academies of Sciences, Engineering, and Medicine 2014. Proposed Guideline for Reliability-Based Bridge Inspection Practices. Washington, DC: The National Academies Press. <https://doi.org/10.17226/22277>.

Table 1: Total Benefits and Cost of the Rule (2019\$, base year=2018), Based on 30 to 65 Percent of Eligible Bridges using the Method 1 Risk-based 48-month Inspection Interval

Components	Discount Rate	10-year Total Amount		Annualized Amount	
		0.07	0.03	0.07	0.03
COSTS					
Section 650.303, 650.307 -Applicability		\$2,987,067	\$4,067,105	\$425,291	\$476,789
Inspection of Bridges on/off Federal highways		\$2,987,067	\$4,067,105	\$425,291	\$476,789
Section 605.305 – Definitions		\$0	\$0	\$0	\$0
Section 650.307 - Bridge Inspection Organization Responsibilities		\$7,144,641	\$9,455,259	\$1,017,236	\$1,108,445
Establish Agreements for Border Bridges		\$1,384,539	\$1,612,469	\$197,127	\$189,031
Maintain Registry of Certified Inspectors		\$208,292	\$283,604	\$29,656	\$33,247
Establish Inspection Organizations		\$5,551,810	\$7,559,186	\$790,453	\$886,167
Section 650.309 - Qualifications of Personnel		\$2,252,075	\$2,731,751	\$320,645	\$320,245
Refresher Training for Program Managers and Team Leaders		\$901,390	\$1,141,477	\$128,338	\$133,816
Training on NSTM Inspections for Team Leaders		\$1,181,278	\$1,375,746	\$168,187	\$161,279
Proprietary Training Review		\$169,407	\$214,528	\$24,120	\$25,149
Section 650.311 - Inspection Intervals		-\$130,991,791	-\$178,354,663	-\$18,650,284	-\$20,908,608
Risk-based, 12-month Inspections		\$32,508,008	\$44,261,970	\$4,628,409	\$5,188,853
Risk-based, Method 1 48-month Inspections, @30 Percent		-\$163,499,799	-\$222,616,634	-\$23,278,693	-\$26,097,461
Risk-based, Method 1 48-month Inspections, @65 percent		-\$354,249,564	-\$482,336,040	-\$50,437,168	-\$56,544,498
Section 650.313 - Inspection Procedures		\$1,892,479	\$2,381,975	\$269,446	\$279,240
Initial and Routine Inspections for Bridges with Phased Const. or Temp. Bridges		\$420,428	\$572,442	\$59,859	\$67,108
Written Policies for Closing Bridges		\$988,956	\$1,151,764	\$140,805	\$135,022
Critical Findings Reporting and Tracking		\$483,095	\$657,769	\$68,782	\$77,111
Section 315 - Inventory		\$1,080,341	\$1,470,962	\$153,816	\$172,442
Bridge Inventory for Tribal Governments		\$1,080,341	\$1,470,962	\$153,816	\$172,442
Section 315 - SNBI		\$111,021,713	\$146,617,401	\$15,806,994	\$17,188,032
Inventory Software Upgrades		\$20,521,881	\$23,900,302	\$2,921,854	\$2,801,844
Updated Inspection Manuals		\$311,521	\$362,806	\$44,354	\$42,532
Additional Inspection Costs from SNBI		\$57,127,326	\$81,852,423	\$8,133,646	\$9,595,601
Additional One-time Inspection Costs for ELI		\$23,491,928	\$27,359,293	\$3,344,722	\$3,207,344
Additional Recurring Inspection Costs for ELI		\$8,795,938	\$12,242,185	\$1,252,344	\$1,435,158
Inspector Training for SNBI		\$773,119	\$900,394	\$110,075	\$105,554
Total Cost of Proposed Rule, @30 percent		-\$4,613,474	-\$11,630,210	-\$656,855	-\$1,363,415
Total Cost of Proposed Rule, @65 percent		-\$195,363,239	-\$271,349,616	-\$27,815,330	-\$31,810,453
BENEFITS					
NBIS		Not Quantified			
SNBI		Not Quantified			
NET BENEFITS					
All Provisions		Not Quantified			

In compliance with the Regulatory Flexibility Act (Pub. L. 96–354, 5 U.S.C. 601–612), FHWA has evaluated the effects of this final rule on small entities. Because these regulations are primarily intended for States and Federal agencies, FHWA has determined that the action is not anticipated to have a significant economic impact on a substantial number of small entities. States and Federal agencies are not included in the definition of small entity set forth in 5 U.S.C. 601. Therefore, FHWA certifies that the action will not have a significant economic impact on a substantial number of small entities.

Unfunded Mandates Reform Act of 1995

FHWA has determined that this final rule will not impose unfunded mandates as defined by the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4, March 22, 1995, 109 Stat. 48). The NBIS is needed to ensure safety for the users of the Nation’s bridges and to help protect Federal infrastructure investment. As discussed above, FHWA finds that this regulatory action will not result in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector, of \$155,000,000 or more in any one year (2 U.S.C. 1532). In addition, the definition of “Federal mandate” in the Unfunded Mandates Reform Act excludes financial assistance of the type in which State, local, or Tribal governments have authority to adjust their participation in the program in accordance with changes made in the program by the Federal Government. The Federal-aid highway program permits this type of flexibility.

Executive Order 13132 (Federalism Assessment)

FHWA has analyzed this final rule in accordance with the principles and criteria contained in E.O. 13132. FHWA has determined that this action will not have sufficient federalism implications to warrant the preparation of a federalism assessment. FHWA has also determined that this action will not preempt any State law or State regulation or affect the States’ ability to discharge traditional State governmental functions.

Executive Order 12372 (Intergovernmental Review)

The regulations implementing E.O. 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program. Local entities should refer to the Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction, for further information.

Paperwork Reduction Act

Under the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501, et seq.), Federal agencies must obtain approval from the Office of Management and Budget (OMB) for each collection of information they conduct, sponsor, or require through regulations. The first data collection in the SNBI format will be in March 2026, which will be discussed in the 2024 notice. Until then, annual data collection will continue under the current notice.

This action contains a collection of information requirement under the PRA that is covered under existing OMB Control number 2125-0501.

National Environmental Policy Act

The Department has analyzed this action for the purpose of the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), and has determined that this action would not have a significant effect on the quality of the environment and qualifies for the categorical exclusion at 23 CFR 771.117(c)(20).

Executive Order 13175 (Tribal Consultation)

In accordance with E.O. 13175, FHWA identified potential effects on federally recognized Indian Tribes that might result from this rule. Accordingly, during the development of the NPRM, FHWA conducted a webinar on August 7, 2014, in furtherance of its duty to consult with Tribal governments under E.O. 13175 “Consultation and Coordination With Indian Tribal Governments.” The webinar dealt with the NBIS and mentioned that FHWA was planning to publish an NPRM sometime

in the future that would include requirements for bridges owned by Tribal governments. The date and time of the webinar had been announced to the Tribal governments through the seven Tribal Technical Assistance Program centers. A total of 35 connections were on the webinar with one or more persons on each connection. Two Tribal governments were identified on the connections and at least one consultant that works with the Tribes was on the webinar. A number of the personnel on the webinar were from BIA and FHWA.

The webinar was conducted by three bridge engineers and one attorney all from FHWA. The PowerPoint presentation and narrative covered the history of the NBIS, the NBIS general requirements based on the current NBIS, and a final section considering the impacts on the Tribal governments caused by the 23 U.S.C. 144(h)(2) amendments to the NBIS. There was a question and answer period after the presentation where general questions about the NBIS were discussed as well as impacts to bridges owned by Tribal governments. Issues discussed included why a NPRM was needed, if trail bridges and pedestrian bridges were subject to the NBIS, and what funding was available for the bridge inspections. The webinar lasted for nearly an hour and was terminated when no more questions were asked. The webinar was recorded and uploaded onto the Tribal Transportation Program Bridge Web site²⁰ maintained by FHWA.

Tribal governments did not submit any comments in response to the NPRM. FHWA continues to work closely with Tribal governments on the implementation of the NBIS program through BIA coordination.

Executive Order 12898 (Environmental Justice)

E.O. 12898 requires that each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate,

²⁰ <https://flh.fhwa.dot.gov/programs/ttp/bridges/bip.htm>

disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minorities and low-income populations. FHWA has determined that this final rule does not raise any environmental justice issues.

Regulation Identification Number

A regulation identification number (RIN) is assigned to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN contained in the heading of this document can be used to cross reference this action with the Unified Agenda.

List of Subjects in 23 CFR Part 650

Bridges, Grant programs—transportation, Highways and roads, Incorporation by reference, Reporting and recordkeeping requirements.

Issued in Washington, DC, under authority delegated in 49 CFR 1.85(a)(1).

Stephanie Pollack
Deputy Administrator
Federal Highway Administration.

In consideration of the foregoing, FHWA amends title 23, Code of Federal Regulations, part 650, as set forth below:

PART 650—BRIDGES, STRUCTURES, AND HYDRAULICS

1. The authority citation for part 650 continues to read as follows:

Authority: 23 U.S.C. 119, 144, and 315.

2. Revise subpart C to read as follows:

Subpart C—National Bridge Inspection Standards (NBIS)

Sec.

650.301 Purpose.

650.303 Applicability.

650.305 Definitions.

650.307 Bridge inspection organization responsibilities.

650.309 Qualification of personnel.

650.311 Inspection interval.

650.313 Inspection procedures.

650.315 Inventory.

650.317 Incorporation by reference.

Subpart C—National Bridge Inspection Standards (NBIS)

§ 650.301 Purpose.

This subpart sets the national minimum standards for the proper safety inspection and evaluation of all highway bridges in accordance with 23 U.S.C. 144(h) and the requirements for preparing and maintaining an inventory in accordance with 23 U.S.C. 144(b).

§ 650.303 Applicability.

The National Bridge Inspection Standards (NBIS) in this subpart apply to all structures defined as highway bridges located on all public roads, on and off Federal-aid highways, including tribally-owned and federally-owned bridges, private bridges that are connected to a public road on both ends of the bridge, temporary bridges, and bridges under construction with portions open to traffic.

§ 650.305 Definitions.

The following terms used in this subpart are defined as follows:

AASHTO Manual. The term “AASHTO Manual” means the American Association of State Highway and Transportation Officials (AASHTO) “Manual for Bridge Evaluation”, including Interim Revisions, excluding the 3rd paragraph in Article 6B.7.1, incorporated by reference in § 650.317.

Attribute. Characteristic of the design, loading, conditions, and environment that affect the reliability of a bridge or bridge member.

Bridge. A structure including supports erected over a depression or an obstruction, such as water, highway, or railway, and having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between under copings of abutments or spring lines of arches, or extreme ends of openings for multiple boxes; it includes multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

Bridge inspection experience. Active participation in bridge inspections in accordance with the this subpart, in either a field inspection, supervisory, or management role. Some of the experience may come from relevant bridge design, bridge load rating, bridge construction, and bridge maintenance experience provided it develops the skills necessary to properly perform a NBIS bridge inspection.

Bridge inspection refresher training. The National Highway Institute¹ (NHI) “Bridge Inspection Refresher Training Course” or other State, federally, or tribally developed instruction aimed to improve quality of inspections, introduce new techniques, and maintain consistency in the inspection program.

Bridge Inspector’s Reference Manual or the BIRM. A comprehensive FHWA manual on procedures and techniques for inspecting and evaluating a variety of in-service highway bridges. This manual is available at the following URL: www.fhwa.dot.gov/bridge/nbis.cfm. This manual may be purchased from the Government Publishing Office, Washington, DC 20402 and from National Technical Information Service, Springfield, VA 22161.

Complex feature. Bridge component(s) or member(s) with advanced or unique structural members or operational characteristics, construction methods, and/or requiring

¹ The NHI training may be found at the following URL: www.nhi.fhwa.dot.gov/.

specific inspection procedures. This includes mechanical and electrical elements of moveable spans and cable-related members of suspension and cable-stayed superstructures.

Comprehensive bridge inspection training. Training that covers all aspects of bridge inspection and enables inspectors to relate conditions observed on a bridge to established criteria (see the BIRM for the recommended material to be covered in a comprehensive training course).

Consequence. A measure of impacts to structural safety and serviceability in a hypothetical scenario where a deterioration mode progresses to the point of requiring immediate action. This may include costs to restore the bridge to safe operating condition or other costs.

Critical finding. A structural or safety related deficiency that requires immediate action to ensure public safety.

Damage inspection. An unscheduled inspection to assess structural damage resulting from environmental factors or human actions.

Deterioration mode. Typical deterioration or damage affecting the condition of a bridge member that may affect the structural safety or serviceability of the bridge.

Element level bridge inspection data. Quantitative condition assessment data, collected during bridge inspections, that indicates the severity and extent of defects in bridge elements.

End-of-course assessment. A comprehensive examination given to students after the completion of the delivery of a training course.

Hands-on inspection. Inspection within arm's length of the member. Inspection uses visual techniques that may be supplemented by nondestructive evaluation techniques.

Highway. The term "highway" is defined in 23 U.S.C. 101.

In-depth inspection. A close-up, detailed inspection of one or more bridge members located above or below water, using visual or nondestructive evaluation techniques as required to identify any deficiencies not readily detectable using routine inspection procedures. Hands-on inspection may be necessary at some locations. In-depth inspections may occur more or less frequently than routine inspections, as outlined in bridge specific inspection procedures.

Initial inspection. The first inspection of a new, replaced, or rehabilitated bridge. This inspection serves to record required bridge inventory data, establish baseline conditions, and establish the intervals for other inspection types.

Inspection date. The date on which the field portion of the bridge inspection is completed.

Inspection due date. The last inspection date plus the current inspection interval.

Inspection report. The document which summarizes the bridge inspection findings, recommendations, and identifies the team leader responsible for the inspection and report.

Internal redundancy. A redundancy that exists within a primary member cross-section without load path redundancy, such that fracture of one component will not propagate through the entire member, is discoverable by the applicable inspection procedures, and will not cause a portion of or the entire bridge to collapse.

Inventory data. All data reported to the National Bridge Inventory (NBI) in accordance with the § 650.315.

Legal load. The maximum load for each vehicle configuration, including the weight of the vehicle and its payload, permitted by law for the State in which the bridge is located.

Legal load rating. The maximum permissible legal load to which the structure may be subjected with the unlimited numbers of passages over the duration of a specified

bridge evaluation period. Legal load rating is a term used in Load and Resistance Factor Rating method.

Load path redundancy. A redundancy that exists based on the number of primary load-carrying members between points of support, such that fracture of the cross section at one location of a member will not cause a portion of or the entire bridge to collapse.

Load posting. Regulatory signs installed in accordance with 23 CFR 655.601 and State or local law which represent the maximum vehicular live load which the bridge may safely carry.

Load rating. The analysis to determine the safe vehicular live load carrying capacity of a bridge using bridge plans and supplemented by measurements and other information gathered from an inspection.

Nationally certified bridge inspector. An individual meeting the team leader requirements of § 650.309(b).

Nonredundant Steel Tension Member (NSTM). A primary steel member fully or partially in tension, and without load path redundancy, system redundancy or internal redundancy, whose failure may cause a portion of or the entire bridge to collapse.

NSTM inspection. A hands-on inspection of a nonredundant steel tension member.

NSTM inspection training. Training that covers all aspects of NSTM inspections to relate conditions observed on a bridge to established criteria.

Operating rating. The maximum permissible live load to which the structure may be subjected for the load configuration used in the load rating. Allowing unlimited numbers of vehicles to use the bridge at operating level may shorten the life of the bridge. Operating rating is a term used in either the Allowable Stress or Load Factor Rating method.

Private bridge. A bridge open to public travel and not owned by a public authority as defined in 23 U.S.C. 101.

Procedures. Written documentation of policies, methods, considerations, criteria, and other conditions that direct the actions of personnel so that a desired end result is achieved consistently.

Probability. Extent to which an event is likely to occur during a given interval. This may be based on the frequency of events, such as in the quantitative probability of failure, or on degree of belief or expectation. Degrees of belief about probability can be chosen using qualitative scales, ranks, or categories such as, remote, low, moderate, or high.

Professional engineer (PE). An individual, who has fulfilled education and experience requirements and passed examinations for professional engineering and/or structural engineering license that, under State licensure laws, permits the individual to offer engineering services within areas of expertise directly to the public.

Program manager. The individual in charge of the program, that has been assigned the duties and responsibilities for bridge inspection, reporting, and inventory, and has the overall responsibility to ensure the program conforms with the requirements of this subpart. The program manager provides overall leadership and is available to inspection team leaders to provide guidance.

Public road. The term “public road” is defined in 23 U.S.C. 101.

Quality assurance (QA). The use of sampling and other measures to assure the adequacy of QC procedures in order to verify or measure the quality level of the entire bridge inspection and load rating program.

Quality control (QC). Procedures that are intended to maintain the quality of a bridge inspection and load rating at or above a specified level.

Rehabilitation. The major work required to restore the structural integrity of a bridge as well as work necessary to correct major safety defects.

Risk. The exposure to the possibility of structural safety or serviceability loss during the interval between inspections. It is the combination of the probability of an event and its consequence.

Risk assessment panel (RAP). A group of well experienced panel members that performs a rigorous assessment of risk to establish policy for bridge inspection intervals.

Routine inspection. Regularly scheduled comprehensive inspection consisting of observations and measurements needed to determine the physical and functional condition of the bridge and identify changes from previously recorded conditions.

Routine permit load. A live load, which has a gross weight, axle weight, or distance between axles not conforming with State statutes for legally configured vehicles, authorized for unlimited trips over an extended period of time to move alongside other heavy vehicles on a regular basis.

Safe load capacity. A live load that can safely utilize a bridge repeatedly over the duration of a specified inspection interval.

Scour. Erosion of streambed or bank material due to flowing water; often considered as being localized around piers and abutments of bridges.

Scour appraisal. A risk-based and data-driven determination of a bridge's vulnerability to scour, resulting from the least stable result of scour that is either observed, or estimated through a scour evaluation or a scour assessment.

Scour assessment. The determination of an existing bridge's vulnerability to scour which considers stream stability and scour potential..

Scour critical bridge. A bridge with a foundation member that is unstable, or may become unstable, as determined by the scour appraisal.

Scour evaluation. The application of hydraulic analysis to estimate scour depths and determine bridge and substructure stability considering potential scour.

Scour plan of action (POA). Procedures for bridge inspectors and engineers in managing each bridge determined to be scour critical or that has unknown foundations.

Service inspection. An inspection to identify major deficiencies and safety issues, performed by personnel with general knowledge of bridge maintenance or bridge inspection.

Special inspection. An inspection scheduled at the discretion of the bridge owner, used to monitor a particular known or suspected deficiency, or to monitor special details or unusual characteristics of a bridge that does not necessarily have defects.

Special permit load. A live load, which has a gross weight, axle weight, or distance between axles not conforming with State statutes for legally configured vehicles and routine permit loads, typically authorized for single or limited trips.

State transportation department. The term “State transportation department” is defined in 23 U.S.C. 101.

System redundancy. A redundancy that exists in a bridge system without load path redundancy, such that fracture of the cross section at one location of a primary member will not cause a portion of or the entire bridge to collapse.

Team leader. The on-site, nationally certified bridge inspector in charge of an inspection team and responsible for planning, preparing, performing, and reporting on bridge field inspections.

Temporary bridge. A bridge which is constructed to carry highway traffic until the permanent facility is built, repaired, rehabilitated, or replaced.

Underwater bridge inspection diver. The individual performing the inspection of the underwater portion of the bridge.

Underwater Bridge Inspection Manual. A comprehensive FHWA manual on the procedures and techniques for underwater bridge inspection. This manual is available at the following URL: www.fhwa.dot.gov/bridge/nbis.cfm. This manual may be purchased from the Government Publishing Office, Washington, DC 20402 and from National Technical Information Service, Springfield, VA 22161.

Underwater bridge inspection training. Training that covers all aspects of underwater bridge inspection to relate the conditions of underwater bridge members to established criteria (see Underwater Bridge Inspection Manual and the BIRM section on underwater inspection for the recommended material to be covered in an underwater bridge inspection training course).

Underwater inspection. Inspection of the underwater portion of a bridge substructure and the surrounding channel, which cannot be inspected visually at low water or by wading or probing, and generally requiring diving or other appropriate techniques.

Unknown Foundations. Foundations of bridges over waterways where complete details are unknown because either the foundation type and depth are unknown, or the foundation type is known, but its depth is unknown, and therefore cannot be appraised for scour vulnerability.

§ 650.307 Bridge inspection organization responsibilities.

(a) Each State transportation department must perform, or cause to be performed, the proper inspection and evaluation of all highway bridges that are fully or partially located within the State's boundaries, except for bridges that are owned by Federal agencies or Tribal governments.

(b) Each Federal agency must perform, or cause to be performed, the proper inspection and evaluation of all highway bridges that are fully or partially located within the respective Federal agency's responsibility or jurisdiction.

(c) Each Tribal government, in consultation with the Bureau of Indian Affairs (BIA) or FHWA, must perform, or cause to be performed, the proper inspection and evaluation of all highway bridges that are fully or partially located within the respective Tribal government's responsibility or jurisdiction.

(d) Where a bridge crosses a border between a State transportation department, Federal agency, or Tribal government jurisdiction, all entities must determine through a joint written agreement the responsibilities of each entity for that bridge under this subpart, including the designated lead State for reporting NBI data.

(e) Each State transportation department, Federal agency, and Tribal government must include a bridge inspection organization that is responsible for the following:

(1) Developing and implementing written Statewide, Federal agencywide, or Tribal governmentwide bridge inspection policies and procedures;

(2) Maintaining a registry of nationally certified bridge inspectors that are performing the duties of a team leader in their State or Federal agency or Tribal government that includes, at a minimum, a method to positively identify each inspector, inspector's qualification records, inspector's current contact information, and detailed information about any adverse action that may affect the good standing of the inspector;

(3) Documenting the criteria for inspection intervals for the inspection types identified in these standards;

(4) Documenting the roles and responsibilities of personnel involved in the bridge inspection program;

(5) Managing bridge inspection reports and files;

(6) Performing quality control and quality assurance activities;

(7) Preparing, maintaining, and reporting bridge inventory data;

(8) Producing valid load ratings and when required, implementing load posting or other restrictions;

(9) Managing the activities and corrective actions taken in response to a critical finding;

(10) Managing scour appraisals and scour plans of action; and

(11) Managing other requirements of these standards.

(f) Functions identified in paragraphs (e)(3) through (11) of this section may be delegated to other individuals, agencies, or entities. The delegated roles and functions of all individuals, agencies, and entities involved must be documented by the responsible State transportation department, Federal agency, or Tribal government. Except as provided below, such delegation does not relieve the State transportation department, Federal agency, or Tribal government of any of its responsibilities under this subpart. A Tribal government may, with BIA's or FHWA's concurrence via a formal written agreement, delegate its functions and responsibilities under this subpart to the BIA or FHWA.

(g) Each State transportation department, Federal agency, or Tribal government bridge inspection organization must have a program manager with the qualifications defined in § 650.309(a). An employee of the BIA or FHWA having the qualification of a program manager as defined in § 650.309(a) may serve as the program manager for a Tribal government if the Tribal government delegates this responsibility to the BIA or FHWA in accordance with paragraph (f) of this section.

§ 650.309 Qualifications of personnel.

(a) A program manager must, at a minimum:

(1) Be a registered Professional Engineer, or have 10 years of bridge inspection experience;

(2) Complete an FHWA-approved comprehensive bridge inspection training course as described in paragraph (h) of this section and score 70 percent or greater on an end-of-course assessment (completion of FHWA-approved comprehensive bridge

inspection training under FHWA regulations in this subpart in effect before [INSERT DATE 30 DAYS ATER DATE OF PUBLICATION IN THE FEDERAL REGISTER], satisfies the intent of the requirement in this paragraph (a));

(3) Complete a cumulative total of 18 hours of FHWA-approved bridge inspection refresher training over each 60 month period;

(4) Maintain documentation supporting the satisfaction of paragraphs (a)(1) through (3) of this section; and

(5) Satisfy the requirements of this paragraph (a) within 24 months from [INSERT DATE 30 DAYS ATER DATE OF PUBLICATION IN THE FEDERAL REGISTER], if serving as a program manager who was qualified under prior FHWA regulations in this subpart.

(b) A team leader must, at a minimum:

(1) Meet one of the four qualifications listed in paragraphs (b)(1)(i) through (iv) of this section:

(i) Be a registered Professional Engineer and have 6 months of bridge inspection experience;

(ii) Have 5 years of bridge inspection experience;

(iii) Have all of the following:

(A) A bachelor's degree in engineering or engineering technology from a college or university accredited by or determined as substantially equivalent by the Accreditation Board for Engineering and Technology; and

(B) Successfully passed the National Council of Examiners for Engineering and Surveying Fundamentals of Engineering examination; and

(C) Two (2) years of bridge inspection experience; or

(iv) Have all of the following:

(A) An associate's degree in engineering or engineering technology from a college or university accredited by or determined as substantially equivalent by the Accreditation Board for Engineering and Technology; and

(B) Four (4) years of bridge inspection experience;

(2) Complete an FHWA-approved comprehensive bridge inspection training course as described in paragraph (h) of this section and score 70 percent or greater on an end-of-course assessment (completion of FHWA-approved comprehensive bridge inspection training under FHWA regulations in this subpart in effect before [INSERT DATE 30 DAYS ATER DATE OF PUBLICATION IN THE FEDERAL REGISTER], satisfies the intent of the requirement in this paragraph (b));

(3) Complete a cumulative total of 18 hours of FHWA-approved bridge inspection refresher training over each 60 month period;

(4) Provide documentation supporting the satisfaction of paragraphs (b)(1) through (3) of this section to the program manager of each State transportation department, Federal agency, or Tribal government for which they are performing bridge inspections; and

(5) Satisfy the requirements of this paragraph (b) within 24 months from [INSERT DATE 30 DAYS ATER DATE OF PUBLICATION IN THE FEDERAL REGISTER], if serving as a team leader who was qualified under prior FHWA regulations in this subpart.

(c) Team leaders on NSTM inspections must, at a minimum:

(1) Meet the requirements in paragraph (b) of this section;

(2) Complete an FHWA-approved training course on the inspection of NSTMs as defined in paragraph (h) of this section and score 70 percent or greater on an end-of-course assessment (completion of FHWA-approved NSTM inspection training prior to

[INSERT DATE 30 DAYS ATER DATE OF PUBLICATION IN THE FEDERAL REGISTER], satisfies the intent of the requirement in this paragraph (c)); and

(3) Satisfy the requirements of this paragraph (c) within 24 months from [INSERT DATE 30 DAYS ATER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(d) Load ratings must be performed by, or under the direct supervision of, a registered professional engineer.

(e) An Underwater Bridge Inspection Diver must complete FHWA-approved underwater bridge inspection training as described in paragraph (h) of this section and score 70 percent or greater on an end-of-course assessment (completion of FHWA-approved comprehensive bridge inspection training or FHWA-approved underwater bridge inspection training under FHWA regulations in this subpart in effect before [INSERT DATE 30 DAYS ATER DATE OF PUBLICATION IN THE FEDERAL REGISTER], satisfies the intent of the requirement in this paragraph (e)).

(f) State transportation departments, Federal agencies, and Tribal governments must establish documented personnel qualifications for Damage and Special Inspection types.

(g) State transportation departments, Federal agencies, and Tribal governments that establish risk-based routine inspection intervals that exceed 48 months under § 650.311(a)(2) must establish documented personnel qualifications for the Service Inspection type.

(h) The following are considered acceptable bridge inspection training:

(1) *National Highway Institute training*. Acceptable NHI courses include:

(i) Comprehensive bridge inspection training, which must include topics of importance to bridge inspection; bridge mechanics and terminology; personal and public safety issues associated with bridge inspections; properties and deficiencies of concrete,

steel, timber, and masonry; inspection equipment needs for various types of bridges and site conditions; inspection procedures, evaluations, documentation, data collection, and critical findings for bridge decks, superstructures, substructures, culverts, waterways (including underwater members), joints, bearings, drainage systems, lighting, signs, and traffic safety features; nondestructive evaluation techniques; load path redundancy and fatigue concepts; and practical applications of the concepts listed in this paragraph (h)(1)(i);

(ii) Bridge inspection refresher training, which must include topics on documentation of inspections, commonly miscoded items, recognition of critical inspection findings, recent events impacting bridge inspections, and quality assurance activities;

(iii) Underwater bridge inspection training, which must include topics on the need for and benefits of underwater bridge inspections; typical defects and deterioration in underwater members; inspection equipment needs for various types of bridges and site conditions; inspection planning and hazard analysis; and underwater inspection procedures, evaluations, documentation, data collection, and critical findings; and

(iv) NSTM inspection training, which must include topics on the identification of NSTMs and related problematic structural details; the recognition of areas most susceptible to fatigue and fracture; the evaluation and recording of defects on NSTMs; and the application of nondestructive evaluation techniques.

(2) *FHWA approval of alternate training.* A State transportation department, Federal agency, or Tribal government may submit to FHWA a training course as an alternate to any of the NHI courses listed in paragraph (h)(1) of this section. An alternate must include all the topics described in paragraph (h)(1) and be consistent with the related content. FHWA must approve alternate course materials and end-of-course assessments for national consistency and certification purposes. Alternate training

courses must be reviewed by the program manager every 5 years to ensure the material is current. Updates to approved course materials and end-of-course assessments must be resubmitted to FHWA for approval.

(3) *FHWA-approved alternate training under prior regulations.* Agencies that have alternate training courses approved by FHWA prior to [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER], have 24 months to review and update training materials to satisfy requirements as defined in § 650.305 and paragraph (h)(1) of this section and resubmit to FHWA for approval.

§ 650.311 Inspection interval.

(a) *Routine inspections.* Each bridge must be inspected at regular intervals not to exceed the interval established using one of the risk-based methods outlined in paragraph (a)(1) or (2) of this section.

(1) *Method 1.* Inspection intervals are determined by a simplified assessment of risk to classify each bridge into one of three categories with an inspection interval as described below.

(i) *Regular intervals.* Each bridge must be inspected at regular intervals not to exceed 24 months, except as required in paragraph (a)(1)(ii) of this section and allowed in paragraphs (a)(1)(iii) of this section.

(ii) *Reduced intervals.* (A) State transportation departments, Federal agencies, or Tribal governments must develop and document criteria used to determine when intervals must be reduced below 24 months. Factors to consider include structure type, design, materials, age, condition ratings, scour, environment, annual average daily traffic and annual average daily truck traffic, history of vehicle impact damage, loads and safe load capacity, and other known deficiencies.

(B) Certain bridges meeting any of the following criteria as recorded in the National Bridge Inventory (NBI) (see § 650.315) must be inspected at intervals not to exceed 12 months:

(1) One or more of the deck, superstructure, or substructure, or culvert components is rated in serious or worse condition, as recorded by the Deck, Superstructure, or Substructure Condition Rating items, or the Culvert Condition Rating item, coded three (3) or less; or

(2) The observed scour condition is rated serious or worse, as recorded by the Scour Condition Rating item coded three (3) or less.

(C) Where condition ratings are coded three (3) or less due to localized deficiencies, a special inspection limited to those deficiencies, as described in § 650.313(h), can be used to meet this requirement in lieu of a routine inspection. In such cases, a complete routine inspection must be conducted in accordance with paragraph (a)(1)(i) of this section.

(iii) *Extended intervals.* (A) Certain bridges meeting all of the following criteria as recorded in the NBI (see § 650.315) may be inspected at intervals not to exceed 48 months:

(1) The deck, superstructure, and substructure, or culvert, components are all rated in satisfactory or better condition, as recorded by the Deck, Superstructure, and Substructure Condition Rating items, or the Culvert Condition Rating item coded six (6) or greater;

(2) The channel and channel protection are rated in satisfactory or better condition, as recorded by the Channel Condition and Channel Protection Condition items coded six (6) or greater;

(3) The inventory rating is greater than or equal to the standard AASHTO HS-20 or HL-93 loading and routine permit loads are not restricted or not carried/issued, as

recorded by the Inventory Load Rating Factor item coded greater than or equal to 1.0 and the Routine Permit Loads item coded A or N;

(4) A steel bridge does not have Category E or E' fatigue details, as recorded by the Fatigue Details item coded N;

(5) All roadway vertical clearances are greater than or equal to 14'-0", as recorded in the Highway Minimum Vertical Clearance item;

(6) All superstructure materials limited to concrete and steel and all superstructure types limited to certain arches, box girders/beams, frames, girders/beams, slabs, and culverts, as recorded by the Span Material items coded C01-C05 or S01-S05, and the Span Type items coded A01, B02-B03, F01-F02, G01-G08, S01-S02, or P01-P02; and

(7) Stable for potential scour and observed scour condition is rated satisfactory or better, as recorded by the Scour Vulnerability item coded A or B and the Scour Condition Rating item coded six (6) or greater.

(B) State transportation departments, Federal agencies, or Tribal governments that implement paragraph (a)(1)(iii)(A) of this section must develop and document an extended interval policy and must notify FHWA in writing prior to implementation. Factors to consider include structure type, design, materials, age, condition ratings, scour, environment, annual average daily traffic and annual average daily truck traffic, history of vehicle impact damage, loads and safe load capacity, and other known deficiencies.

(2) *Method 2.* Inspection intervals are determined by a more rigorous assessment of risk to classify each bridge, or a group of bridges, into one of four categories, with inspection intervals not to exceed 12, 24, 48, or 72 months. The risk assessment process must be developed by a Risk Assessment Panel (RAP) and documented as a formal policy. The RAP must be comprised of not less than four people, at least two of which are professional engineers, with collective knowledge in bridge design, evaluation, inspection, maintenance, materials, and construction, and include the NBIS program

manager. The policy and criteria which establishes intervals, including subsequent changes, must be submitted by the State transportation department, Federal agency, or Tribal government for FHWA approval. The request must include the items in paragraphs (a)(2)(i) through (vi) of this section:

(i) Endorsement from a RAP, which must be used to develop a formal policy.

(ii) Definitions for risk factors, categories, and the probability and consequence levels that are used to define the risk for each bridge to be assessed.

(iii) Deterioration modes and attributes that are used in classifying probability and consequence levels, depending on their relevance to the bridge being considered. A system of screening, scoring, and thresholds are defined by the RAP to assess the risks. Scoring is based on prioritizing attributes and their relative influence on deterioration modes.

(A) A set of screening criteria must be used to determine how a bridge should be considered in the assessment and to establish maximum inspection intervals. The screening criteria must include:

(1) Requirements for flexure and shear cracking in concrete primary load members;

(2) Requirements for fatigue cracking and corrosion in steel primary load members;

(3) Requirements for other details, loadings, conditions, and inspection findings that are likely to affect the safety or serviceability of the bridge or its members;

(4) Bridges classified as in poor condition cannot have an inspection interval greater than 24 months; and

(5) Bridges classified as in fair condition cannot have an inspection interval greater than 48 months.

(B) The attributes in each assessment must include material properties, loads and safe load capacity, and condition.

(C) The deterioration modes in each assessment must include:

(1) For steel members: section loss, fatigue, and fracture;

(2) For concrete members: flexural cracking, shear cracking, and reinforcing and prestressing steel corrosion;

(3) For superstructure members: settlement, rotation, overload, and vehicle/vessel impact; and

(4) For substructure members: settlement, rotation, and scour.

(D) A set of criteria to assess risk for each bridge member in terms of probability and consequence of structural safety or serviceability loss in the time between inspections.

(iv) A set of risk assessment criteria, written in standard logical format amenable for computer programming.

(v) Supplemental inspection procedures and data collection that are aligned with the level of inspection required to obtain the data to apply the criteria.

(vi) A list classifying each bridge into one of four risk categories with a routine inspection interval not to exceed 12, 24, 48, or 72 months.

(3) *Service inspection.* A service inspection must be performed during the month midway between routine inspections when a risk-based, routine inspection interval exceeds 48 months.

(4) *Additional routine inspection interval eligibility.* Any new, rehabilitated, or structurally modified bridge must receive an initial inspection, be in service for 24 months, and receive its next routine inspection before being eligible for inspection intervals greater than 24 months.

(b) *Underwater inspections.* Each bridge must be inspected at regular intervals not to exceed the interval established using one of the risk-based methods outlined in paragraph (b)(1) or (2) of this section.

(1) *Method 1.* Inspection intervals are determined by a simplified assessment of risk to classify each bridge into one of three categories for an underwater inspection interval as described in this section.

(i) *Regular intervals.* Each bridge must be inspected at regular intervals not to exceed 60 months, except as required in paragraph (b)(1)(ii) of this section and allowed in paragraph (b)(1)(iii) of this section.

(ii) *Reduced intervals.* (A) State transportation departments, Federal agencies, or Tribal governments must develop and document criteria used to determine when intervals must be reduced below 60 months. Factors to consider include structure type, design, materials, age, condition ratings, scour, environment, annual average daily traffic and annual average daily truck traffic, history of vehicle/vessel impact damage, loads and safe load capacity, and other known deficiencies.

(B) Certain bridges meeting at least any of the following criteria as recorded in the NBI (see § 650.315) must be inspected at intervals not to exceed 24 months:

(1) The underwater portions of the bridge are in serious or worse condition, as recorded by the Underwater Inspection Condition item coded three (3) or less;

(2) The channel or channel protection is in serious or worse condition, as recorded by the Channel Condition and Channel Protection Condition items coded three (3) or less; or

(3) The observed scour condition is three (3) or less, as recorded by the Scour Condition Rating item.

(C) Where condition ratings are coded three (3) or less due to localized deficiencies, a special inspection of the underwater portions of the bridge limited to those

deficiencies, as described in § 650.313(h), can be used to meet this requirement in lieu of a complete underwater inspection. In such cases, a complete underwater inspection must be conducted in accordance with paragraph (b)(1)(i) of this section.

(iii) *Extended intervals.* (A) Certain bridges meeting all of the following criteria as recorded in the NBI (see § 650.315) may be inspected at intervals not to exceed 72 months:

(1) The underwater portions of the bridge are in satisfactory or better condition, as recorded by the Underwater Inspection Condition item coded six (6) or greater;

(2) The channel and channel protection are in satisfactory or better condition, as indicated by the Channel Condition and Channel Protection Condition items coded six (6) or greater;

(3) Stable for potential scour, Scour Vulnerability item coded A or B, and Scour Condition Rating item is satisfactory or better, coded six (6) or greater.

(B) State transportation departments, Federal agencies, or Tribal governments that implement paragraph (b)(1)(iii)(A) of this section must develop and document an underwater extended interval policy and must notify FHWA in writing prior to implementation. Factors to consider include structure type, design, materials, age, condition ratings, scour, environment, annual average daily traffic and annual average daily truck traffic, history of vehicle/vessel impact damage, loads and safe load capacity, and other known deficiencies.

(2) *Method 2.* Inspection intervals are determined by a more rigorous assessment of risk. The policy and criteria which establishes intervals, including subsequent changes, must be submitted by the State transportation department, Federal agency, or Tribal government for FHWA approval. The process and criteria must be similar to that outlined in paragraph (a)(2) of this section except that each bridge must be classified into

one of three risk categories with an underwater inspection interval not to exceed 24, 60, and 72 months.

(c) *NSTM inspections.* NSTMs must be inspected at regular intervals not to exceed the interval established using one of the risk-based methods outlined in paragraph (c)(1) or (2) of this section.

(1) *Method 1.* Inspection intervals are determined by a simplified assessment of risk to classify each bridge into one of three risk categories with an interval not to exceed 12, 24, or 48 months.

(i) *Regular intervals.* Each NSTM must be inspected at intervals not to exceed 24 months except as required in paragraph (c)(1)(ii) of this section and allowed in paragraph (c)(1)(iii) of this section.

(ii) *Reduced intervals.* (A) State transportation departments, Federal agencies, or Tribal governments must develop and document criteria to determine when intervals must be reduced below 24 months. Factors to consider include structure type, design, materials, age, condition, environment, annual average daily traffic and annual average daily truck traffic, history of vehicle impact damage, loads and safe load capacity, and other known deficiencies.

(B) Certain NSTMs meeting the following criteria as recorded in the NBI (see § 650.315) must be inspected at intervals not to exceed 12 months:

(1) The NSTMs are rated in poor or worse condition, as recorded by the NSTM Inspection Condition item, coded 4 or less; or

(2) [Reserved].

(iii) *Extended intervals.* (A) Certain NSTMs meeting all of the following criteria may be inspected at intervals not to exceed 48 months:

(1) Bridge was constructed after 1978 as recorded in the NBI (see § 650.315) Year Built item and fabricated in accordance with a fracture control plan;

- (2) All NSTMs have no fatigue details with finite life;
- (3) All NSTMs have no history of fatigue cracks;
- (4) All NSTMs are rated in satisfactory or better condition, as recorded in the NBI (see § 650.315) by the NSTM Inspection Condition item, coded 6 or greater; and
- (5) The bridge's inventory rating is greater than or equal to the standard AASHTO HS-20 or HL-93 loading and routine permit loads are not restricted or not carried/issued, as recorded in the NBI (*see* § 650.315) by the Inventory Load Rating Factor item coded greater than or equal to 1.0 and the Routine Permit Loads item coded A or N;
- (6) All NSTMs do not include pin and hanger assemblies.

(B) State transportation departments, Federal agencies, or Tribal governments that implement paragraph (c)(1)(iii)(A) of this section must develop and document an extended interval policy, and notify FHWA in writing prior to implementation. Factors to consider include structure type, design, materials, age, condition, environment, annual average daily traffic and annual average daily truck traffic, history of vehicle impact damage, loads and safe load capacity, and other known deficiencies.

(2) *Method 2.* Inspection intervals are determined by a more rigorous assessment of risk. The policy and criteria which establishes intervals, including subsequent changes must be submitted by the State transportation department, Federal agency, or Tribal government for FHWA approval. The process and criteria must be similar to that outlined in paragraph (a)(2) of this section except that each bridge must be classified into one of three risk categories with a NSTM inspection interval not to exceed 12, 24, or 48 months.

(d) *Damage, in-depth, and special inspections.* A State transportation department, Federal agency, or Tribal government must document the criteria to determine the level and interval for these inspections in its bridge inspection policies and procedures.

(e) *Bridge inspection interval tolerance.* (1) The acceptable tolerance for intervals of less than 24 months for the next inspection is up to two (2) months after the month in which the inspection was due.

(2) The acceptable tolerance for intervals of 24 months or greater for the next inspection is up to three (3) months after the month in which the inspection was due.

(3) Exceptions to the inspection interval tolerance due to rare and unusual circumstances must be approved by FHWA in advance of the inspection due date plus the tolerance in paragraphs (e)(1) and (2) of this section.

(f) *Next inspection.* Establish the next inspection interval for each inspection type based on results of the inspection and requirements of this section.

(g) *Implementation.* (1) The requirements of paragraphs (a)(1)(ii), (b)(1)(ii), and (c)(1)(ii) of this section must be satisfied within 24 months from [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(2) Prior FHWA approved extended inspection interval policies will be rescinded 24 months after [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

§ 650.313 Inspection procedures.

(a) *General.* Inspect each bridge to determine condition, identify deficiencies, and document results in an inspection report in accordance with the inspection procedures in Section 4.2, AASHTO Manual (incorporated by reference, *see* § 650.317). Special equipment or techniques, and/or traffic control are necessary for inspections in circumstances where their use provide the only practical means of accessing and/or determining the condition of the bridge. The equipment may include advanced technologies listed in the BIRM.

(b) *Initial inspection.* Perform an initial inspection in accordance with Section 4.2, AASHTO Manual (incorporated by reference, *see* § 650.317) for each new, replaced,

rehabilitated, and temporary bridge as soon as practical, but within 3 months of the bridge opening to traffic.

(c) *Routine inspection.* Perform a routine inspection in accordance with Section 4.2, AASHTO Manual (incorporated by reference, *see* § 650.317).

(d) *In-depth inspection.* Identify the location of bridge members that need an in-depth inspection and document in the bridge files. Perform in-depth inspections in accordance with the procedures developed in paragraph (g) of this section.

(e) *Underwater inspection.* Identify the locations of underwater portions of the bridge in the bridge files that cannot be inspected using wading and probing during a routine inspection. Perform underwater inspections in accordance with the procedures developed in paragraph (g) of this section. Perform the first underwater inspection for each bridge and for each bridge with portions underwater that have been rehabilitated as soon as practical, but within 12 months of the bridge opening to traffic.

(f) *NSTM inspection.* (1) Identify the locations of NSTMs in the bridge files.

(i) A State transportation department, Federal agency, or Tribal government may choose to demonstrate a member has system or internal redundancy such that it is not considered an NSTM. The entity may develop and submit a formal request for FHWA approval of procedures using a nationally recognized method to determine that a member has system or internal redundancy. FHWA will review the procedures for approval based upon conformance with the nationally recognized method. The request must include:

(A) Written policy and procedures for determining system or internal redundancy.

(B) Identification of the nationally recognized method used to determine system or internal redundancy. Nationally recognized means developed, endorsed and disseminated by a national organization with affiliates based in two or more States; or currently adopted for use by one or more State governments or by the Federal Government; and is the most current version.

(C) Baseline condition of the bridge(s) to which the policy is being applied.

(D) Description of design and construction details on the member(s) that may affect the system or internal redundancy.

(E) Routine inspection requirements for bridges with system or internally redundant members.

(F) Special inspection requirements for the members with system or internal redundancy.

(G) Evaluation criteria for when members should be reviewed to ensure they still have system and internal redundancy.

(ii) Inspect the bridge using the approved methods outlined in paragraphs (f)(1)(i)(E) and (F) of this section.

(2) Perform hands-on inspections of NSTMs in accordance with the procedures developed in paragraph (g) of this section.

(3) Perform the first NSTM inspection for each bridge and for each bridge with rehabilitated NSTMs as soon as practical, but within 12 months of the bridge opening to traffic.

(g) *NSTM, underwater, in-depth, and complex feature inspection procedures.* Develop and document inspection procedures for bridges which require NSTM, underwater, in-depth, and complex feature inspections in accordance with Section 4.2, AASHTO Manual (incorporated by reference, *see* § 650.317). State transportation departments, Federal agencies, and Tribal governments can include general procedures applicable to many bridges in their procedures manual. Specific procedures for unique and complex structural features must be developed for each bridge and contained in the bridge file.

(h) *Special inspection.* For special inspections used to monitor conditions as described in paragraphs (a)(1)(ii) and (b)(1)(ii) of this section, develop and document

procedures in accordance with Section 4.2, AASHTO Manual (incorporated by reference, *see* § 650.317).

(i) *Service inspection.* Perform a service inspection when the routine inspection interval is greater than 48 months. Document the inspection date and any required follow up actions in the bridge file.

(j) *Team leader.* Provide at least one team leader at the bridge who meets the minimum qualifications stated in § 650.309 and actively participates in the inspection at all times during each initial, routine, in-depth, NSTM, underwater inspection, and special inspection described in paragraph (h) of this section.

(k) *Load rating.* (1) Rate each bridge as to its safe load capacity in accordance with the incorporated articles in Sections 6 and 8, AASHTO Manual (incorporated by reference, *see* § 650.317).

(2) Develop and document procedures for completion of new and updated bridge load ratings. Load ratings must be completed as soon as practical, but no later than 3 months after the initial inspection and when a change is identified that warrants a re-rating such as, but not limited to, changes in condition, reconstruction, new construction, or changes in dead or live loads.

(3) Analyze routine and special permit loads for each bridge that these loads cross to verify the bridge can safely carry the load.

(l) *Load posting.* (1) Implement load posting or restriction for a bridge in accordance with the incorporated articles in Section 6, AASHTO Manual (incorporated by reference, *see* § 650.317), when the maximum unrestricted legal loads or State routine permit loads exceed that allowed under the operating rating, legal load rating, or permit load analysis.

(2) Develop and document procedures for timely load posting based upon the load capacity and characteristics such as annual average daily traffic, annual average daily

truck traffic, and loading conditions. Posting shall be made as soon as possible but not later than 30 days after a load rating determines a need for such posting. Implement load posting in accordance with these procedures.

(3) Missing or illegible posting signs shall be corrected as soon as possible but not later than 30 days after inspection or other notification determines a need.

(m) *Closed bridges.* Develop and document criteria for closing a bridge which considers condition and load carrying capacity for each legal vehicle. Bridges that meet the criteria must be closed immediately. Bridges must be closed when the gross live load capacity is less than 3 tons.

(n) *Bridge files.* Prepare and maintain bridge files in accordance with Section 2.2, AASHTO Manual (incorporated by reference, *see* § 650.317).

(o) *Scour.* (1) Perform a scour appraisal for all bridges over water, and document the process and results in the bridge file. Re-appraise when necessary to reflect changing scour conditions. Scour appraisal procedures should be consistent with Hydraulic Engineering Circulars (HEC) 18 and 20. Guidance for scour evaluations is located in HEC 18 and 20, and guidance for scour assessment is located in HEC 20.

(2) For bridges which are determined to be scour critical or have unknown foundations, prepare and document a scour POA for deployment of scour countermeasures for known and potential deficiencies, and to address safety concerns. The plan must address a schedule for repairing or installing physical and/or hydraulic scour countermeasures, and/or the use of monitoring as a scour countermeasure. Scour plans of actions should be consistent with HEC 18 and 23.

(3) Execute action in accordance with the plan.

(p) *Quality control and quality assurance.* (1) Assure systematic QC and QA procedures identified in Section 1.4, AASHTO Manual (incorporated by reference, *see*

§ 650.317) are used to maintain a high degree of accuracy and consistency in the inspection program.

(2) Document the extent, interval, and responsible party for the review of inspection teams in the field, inspection reports, NBI data, and computations, including scour appraisal and load ratings. QC and QA reviews are to be performed by personnel other than the individual who completed the original report or calculations.

(3) Perform QC and QA reviews and document the results of the QC and QA process, including the tracking and completion of actions identified in the procedures.

(4) Address the findings of the QC and QA reviews.

(q) *Critical findings.* (1) Document procedures to address critical findings in a timely manner. Procedures must:

(i) Define critical findings considering the location and the redundancy of the member affected and the extent and consequence of a deficiency. Deficiencies include, but are not limited to scour, damage, corrosion, section loss, settlement, cracking, deflection, distortion, delamination, loss of bearing, and any condition posing an imminent threat to public safety. At a minimum, include findings which warrant the following:

(A) Full or partial closure of any bridge;

(B) An NSTM to be rated in serious or worse condition, as defined in the NBI (*see* § 650.315) by the NSTM Inspection item, coded three (3) or less;

(C) A deck, superstructure, substructure, or culvert component to be rated in critical or worse condition, as defined in the NBI (*see* § 650.315) by the Deck, Superstructure, or Substructure Condition Rating items, or the Culvert Condition Rating item, coded two (2) or less;

(D) The channel condition or scour condition to be rated in critical or worse condition as defined in the NBI (*see* § 650.315) by the Channel Condition Rating or Scour Condition Rating items, coded critical (2) or less; or

(E) Immediate load restriction or posting, or immediate repair work to a bridge, including shoring, in order to remain open.

(ii) Develop and document timeframes to address critical findings identified in paragraph (q)(1)(i) of this section.

(2) State transportation departments, Federal agencies, and Tribal governments must inform FHWA of all critical findings and actions taken, underway, or planned to resolve critical findings as follows:

(i) Notify FHWA within 24 hours of discovery of each critical finding on the National Highway System (NHS) as identified in paragraphs (q)(1)(i)(A) and (B) of this section;

(ii) Provide monthly, or as requested, a written status report for each critical finding as identified in paragraph (q)(1)(i) of this section until resolved. The report must contain:

(A) Owner;

(B) NBI Structure Number;

(C) Date of finding;

(D) Description and photos (if available) of critical finding;

(E) Description of completed, temporary and/or planned corrective actions to address critical finding;

(F) Status of corrective actions: Active/Completed;

(G) Estimated date of completion if corrective actions are active; and

(H) Date of completion if corrective actions are completed.

(r) *Review of compliance.* Provide information annually or as required in cooperation with any FHWA review of compliance with this subpart.

§ 650.315 Inventory.

(a) Each State transportation department, Federal agency, or Tribal government must prepare and maintain an inventory of all bridges subject to this subpart. Inventory data, as defined in § 650.305, must be collected, updated, and retained by the responsible State transportation department, Federal agency, or Tribal government and submitted to FHWA on an annual basis or whenever requested. For temporary bridges open to traffic greater than 24 months, inventory data must be collected and submitted per this section. Inventory data must include element level bridge inspection data for bridges on the NHS collected in accordance with the “Manual for Bridge Element Inspection” (incorporated by reference, *see* § 650.317). Specifications for collecting and reporting this data are contained in the “Specifications for the National Bridge Inventory” (incorporated by reference, *see* § 650.317).

(b) For all inspection types, enter changes to the inventory data into the State transportation department, Federal agency, or Tribal government inventory within 3 months after the month when the field portion of the inspection is completed.

(c) For modifications to existing bridges that alter previously recorded inventory data and for newly constructed bridges, enter the inventory data into the State transportation department, Federal agency, or Tribal government inventory within 3 months after the month of opening to traffic.

(d) For changes in load restriction or closure status, enter the revised inventory data into the State transportation department, Federal agency, or Tribal government inventory within 3 months after the month the change in load restriction or closure status of the bridge is implemented.

(e) Each State transportation department, Federal agency, or Tribal government must establish and document a process that ensures the time constraint requirements of paragraphs (b) through (d) of this section are fulfilled.

§ 650.317 Incorporation by reference .

Certain material is incorporated by reference (IBR) into this subpart with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. All approved material is available for inspection at the U.S. Department of Transportation (DOT) and the National Archives and Records Administration (NARA). Contact DOT at: U.S. Department of Transportation Library, 1200 New Jersey Avenue, SE., Washington, DC 20590 in Room W12-300, (800) 853-1351, www.ntl.bts.gov/ntl. For information on the availability of this material at NARA email: fr.inspection@nara.gov or go to: www.archives.gov/federal-register/cfr/ibr-locations.html. The material may be obtained from the following sources:

(a) AASHTO. American Association of State Highway and Transportation Officials, 555 12th Street NW, Suite 1000, Washington, DC 20004; 1-800-231-3475; <https://store.transportation.org>.

(1) MBE-3. “The Manual for Bridge Evaluation,” Third Edition, 2018; IBR approved for § 650.305 and 650.313.:

(2) MBE-3-I1-OL. The Manual for Bridge Evaluation, 2019 Interim Revisions [to 2018 Third Edition], copyright 2018; IBR approved for § 650.305 and 650.313.

(3) MBE-3-I2. The Manual for Bridge Evaluation, 2020 Interim Revisions [to 2018 Third Edition], copyright 2020; IBR approved for § 650.305 and 650.313.

(4) MBEI-2: Manual for Bridge Element Inspection, Second Edition, 2019, IBR approved for § 650.315.

(b) FHWA. Federal Highway Administration, 1200 New Jersey Avenue, SE, Washington, DC 20590; 1-202-366-4000; www.fhwa.dot.gov/bridge/nbi.cfm.

(1) FHWA-HIF-22-017: Specifications for the National Bridge Inventory, March, 2022, IBR approved for § 650.315.

(2) [Reserved].

Subpart D—[Removed and Reserved]

3. Remove and reserve subpart D.

Subpart G—[Removed and Reserved]

4. Remove and reserve subpart G.

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